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In THE MUNICIPAL INDEX (the annual reference volume of data and condensed catalogs published by the American City Magazine Corporation) readers will find much material, including lists, and articles on a wide variety of municipal and civic subjects, not published in the monthly issues of the magazine.

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WORLD'S LARGEST WATER DEVELOPERS

LAYNE'S 50 Years OF ACHIEVEMENT

1883 - 1933

AND now Time's great hand begins to etch the record of Layne's 50th year.

¶ Behind lies a half century of ceaseless research . . . of fearless pioneering . . . *and, above all, of notable achievement.*

¶ Out of the vision and once single-handed labor of its founder, Layne has risen to unrivaled leadership as—

¶ "THE WORLD'S LARGEST WATER DEVELOPERS."

¶ In thousands of towns, cities and industries the world over—Layne Pumps set the standard for economy and efficiency.

¶ As yet Layne Well Water Systems are unmatched in maximum water production at minimum cost.

¶ And it is reasonable to believe that out of Layne's continued research in field and laboratory will come still greater developments—developments that will surpass even those of Layne's first 50 years of achievement.

¶ Detailed bulletins that are of special value and interest to all municipal officials will be sent to you without obligation. Address Department B, Layne & Bowler, Inc., Memphis, Tenn.

LAYNE PUMPS
AND WELL WATER SYSTEMS

Public Works—Banker Control—Low-Cost Housing

Self-Liquidating Projects Flow in Sluggish Stream

ONLY $17,793,000 to finance construction on self-liquidating projects—a little over *one per cent* of the billion and a half of Federal funds made available under Title II of the Emergency Relief and Construction Act of 1932—has actually been disbursed (up to January 23, 1933) by the Reconstruction Finance Corporation. The need for liberalizing the provisions of the Act, including a lowering of interest rates and removal of the "self-liquidating" restrictions, becomes increasingly evident, therefore, if Federal aid is to become really effective in breaking the bread lines.

Approval of forty-nine R. F. C. loans—many of which have struck snags of one kind or another—have been reported on this page since the 1932 Act went into effect last July. These loans authorized up to the end of 1932 aggregate $146,249,500. The following were approved in January:

Reeves County Water Improvement District No. 1, Balmorhea, Texas, repairs to irrigation system	$ 40,000
Fabens Water Co., Fabens, Texas, improvement and extension of water-distribution system	15,000
Pensacola, Florida, additions and improvements to water-works system	50,000
Riverton Pipe Line Co., Riverton, Utah, reinforced concrete storage reservoir and pipe replacements	20,000
Quincy, Florida, deep-well pump, two water-softening units and elevated storage tank	16,000
San Juan, Puerto Rico, improvements and extensions to water system	1,300,000
University of Colorado, Boulder, Colo., new dormitory and refectory	550,000
Greenville, Miss., river freight terminal	175,000
Vernal City, Utah, rehabilitation of water system; new cast-iron main	38,000
Glen Rose, Texas, new water-works and sanitary sewer system	45,000
Orleans Levee District, New Orleans, La., flood protection works and an airport	1,300,000
Cambridge, Ohio, intercepting sanitary sewer	25,000
Long Pine, Nebr., development of new source of supply for water system	15,000

The Menace of Banker Control of Municipal Expenditures

"IF the bankers are to assume to dictate to cities, there are certain responsibilities that must inevitably go with this dictation. The bankers cannot attempt to prescribe economy and avoid responsibility if unwise and deceptive economies result. The New York City situation illustrates my point."

This was the theme of an address delivered at the Annual Eastern Regional Savings Conference, in New York on January 27, by Joseph McGoldrick, of the Department of Public Law, Columbia University, who pointed out that good government cannot be achieved by arbitrary budget-slashing or by the abolition of restraints on private irresponsibility:

"If this depression teaches anything—and I am very far from being optimistic enough to believe that we shall learn anything from it—it teaches that we shall need more rather than less regulation in our economic life in the future. The task of city government would certainly have to include a very much greater degree of city planning, and it must be a city planning not limited to esthetic objectives but deeply concerned with the economic consequences of capital commitments. We have got to consider not merely *where* certain activities shall be placed, but *what* activities shall be placed. In a town oversupplied with theaters, office buildings and hotels, we shall have to ask whether we can allow the building of even bigger theaters, office buildings and hotels. The role of government has already been substantially enlarged at Washington since this depression began, and it seems perfectly clear to me that it will have to be enlarged even further if we are not to be faced within our generation with a second crisis far more severe than this."

On the subject of salary reduction for municipal employees, Dr. McGoldrick deplored the disgracefully chaotic state of the city's payroll schedule. While recognizing the fact that reductions in many of the higher paid classifications may be desirable, the speaker showed the serious harm which might result from a drastic cut aggregating $20,000,000 in the city's payroll, such as certain financial interests had demanded. "The bankers," he said, "should have been the very last people to urge such a reduction. If you are seeking to avoid an inflation, then everything that makes for further deflation must be resisted. These deflationary steps are cumulative. A diminution of $20,000,000 in the spending power of the New York City employee group is certain to be reflected in the general volume of business done in this community. In fact, it is likely to be reflected even in rents."

Dr. McGoldrick concluded with a challenge to enlightened financial leadership:

"The banks are the most important agency for control under our present arrangements. This is not merely an opportunity; it is a responsibility. It is a responsibility that must be exercised with regard not merely to the advantage of the banking institutions that exercise it; it is a responsibility that must be exercised with a consideration of the best interests of the investing public and of the general public as well. There is little room for pride in the way these responsibilities were exercised in the last decade. I think we can confidently predict that if the bankers do not show that they are prepared to act with a greater regard to general well-being in the next decade, they will be superseded by some other type of social control."

An Aid to Sound Legislation for Low-Cost Housing

A SERVICE of the greatest value to legislators and local groups desirous of making possible, in their respective states and cities, the securing of loans through the Reconstruction Finance Corporation for limited-dividend housing corporations, has been rendered by Charles S. Ascher and the National Municipal League. Mr. Ascher has written, and the *National Municipal Review* is publishing as a supplement to its February issue, a comprehensive monograph on "Elements of a Low-Cost Housing Law and Its Administration."

With his background of study and experience as a member of the New York Bar, as Secretary of the City Housing Corporation of New York, and his staff connection with the Public Administration Clearing House, of Chicago, Mr. Ascher is exceptionally equipped for a task which he has performed with great skill. The result is a publication which will save much time and aid greatly in avoiding pitfalls for committees drafting state housing legislation.

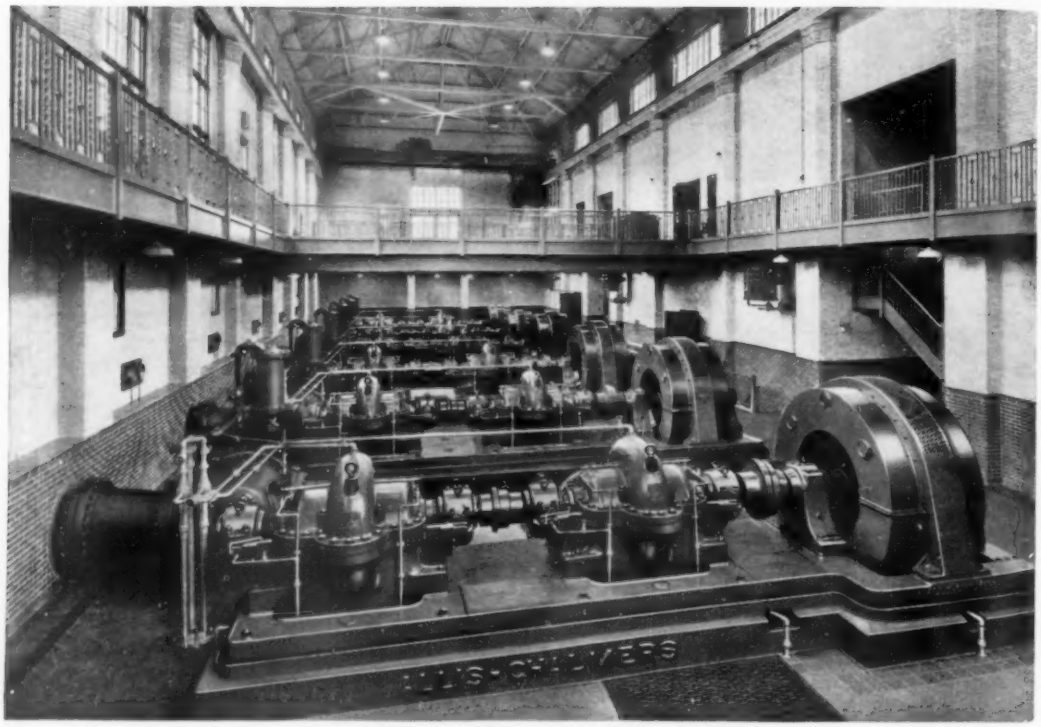
While little progress can be reported towards the actual use of large-scale housing projects as a means of restoring employment and purchasing power, the advantages of such an attack on the depression are becoming increasingly realized. In *Time* for January 23, for example, Oliver M. W. Sprague, Professor of Banking and Finance at Harvard University, and Economic Adviser of the Bank of England, is quoted as advocating house-building on such a scale as to release the vast purchasing power of myriads of people who would rush to buy houses today if the prices were not prohibitive.

More Than Seven Billion Over-Subscription on Treasury Notes

ON a new offering of $250,000,000 in five-year 2⅝ per cent notes, the Treasury Department announced on January 26 that tenders had been received amounting to $7,800,000,000. This tremendous over-subscription of more than 3,000 per cent—although indicating, as Secretary Mills has pointed out, that many subscribers had applied for amounts far in excess of their requirements—gives nevertheless unmistakable evidence of the availability of ample funds for sound investment at low rates.

As shown on page 72 of this issue, high-grade municipal bonds have been sold in recent weeks at interest rates as low as 2.83 per cent.

Synchronous Motor Driven Centrifugal Pumping Units *for City of Pittsburgh, Pa.*



Pumps and motors were designed and built by Allis-Chalmers Manufacturing Company.

Ratings: Two units each consisting of two 30 in. by 24 in. Type "SG" pumps in series and 1500-horsepower motors rated 24 million gallons per day against 272 feet head at 720 revolutions per minute. Four units each consisting of two 30 in. by 24 in. Type "SG" pumps in series and 2250-horsepower motors rated 28 million gallons per day against 365 feet head at 720 revolutions per minute.

Overall Efficiency: The guaranteed overall efficiency of pump and motor for the 24 million gallon units was 84.9% and the guaranteed overall efficiency of the 28 million gallon units was 85.4%. These efficiencies were exceeded by a good margin both on shop tests and on field tests conducted by the city.

A 60-M. G. D. Allis-Chalmers steam turbine driven unit recently put in operation by the City of Milwaukee, Wis., exceeded by a good margin, the guaranteed duty on field test conducted by the city.

These are only two examples of many where Allis-Chalmers pumping units are saving money for large and small municipalities.

ALLIS-CHALMERS

Allis-Chalmers Manufacturing Company, Milwaukee

Pure Water—Man's Greatest Need

Items on Water Supply and Purification

Water Department Keeps Separate Accounts

THE Water Department of Garden City, Long Island, N. Y., has always been self-supporting, for which reason revenues and expenditures are always stated separately in any report and are not included in the village budget. It was found possible in the fall of 1931 to lower the minimum annual rate from $18 to $15, resulting in a small saving to about 60 per cent of the water consumers. Surplus revenues are used for additions to the plant and for the retirement of the funded debt. During the fiscal year 1931-32 $24,000 of bonds were retired.

A new well of 2,100,000 gallons daily capacity has been constructed and 6,566 feet of water mains have been built at an aggregate cost of $33,266.53. In the same fiscal year, the village also installed electric pumps in the water pumping plant to take the place of the steam pumps which had been in use for many years. The steam pumps are, however, kept in reserve for emergency use, as are two boilers. All this new construction was paid for out of Water Department surplus funds without any bond financing. The daily consumption of water in 1931 ranged from a minimum of 932,758 gallons to a maximum of 2,160,000 per day as compared with a total well capacity of 7,794,000 gallons per day. The total amount of water pumped into the mains at the water works in 1931 was 406,539,500 gallons.

The present water tower at Old County Road, although it holds a reserve of 662,000 gallons, has an effective capacity of only 300,000 gallons and must be replaced or supplemented in the near future. It is anticipated that this capital expenditure, like all recent Water Department improvements, can be met without resort to bond financing.

There are 2,623 water service connections to the system, a gain of 255 in the past year. The number of water consumers is 1,965, and of water meters in service, 2,029. The water system includes 54.476 miles of mains and there are 503 fire hydrants, a gain of 18 in the last year.

C. R. McKAY,
Superintendent of Public Works.

Experience with Ammonia, Chlorine and Activated Carbon

THE Springfield, Ill., water purification plant was one of the first in the United States to use ammonia in the prevention of chlorinous tastes and odors, beginning about four years ago. The method has now been widely adopted and successfully used in many other city supplies. It has effectually disposed of chlorinous tastes in the Springfield water supply and has improved plant efficiency. During the past year a change was made from anhydrous ammonia to ammonium sulphate on account of more favorable prices for the latter amounting to 50 per cent reduction per unit of ammonia.

Chlorine has been applied, as usual, chiefly in the raw water, where 7.96 pounds per million gallons were used; while only 0.49-pound per million gallons was applied in the filtered water. Application of the chlorine to the raw water lengthens the time of contact and increases the margin of safety. Brief interruptions of treatment in this manner have no perceptible effect on the quality of the water, and the basins are kept free from growth of algae on bottoms and side walls.

An agent for removal of odors and tastes has come into use in water purification plants during the past two years. This is powdered activated carbon, a material which has been widely used heretofore in other technical arts for adsorption of odors, tastes and colors. During the past year its use with Springfield water at certain times has helped materially to remove disagreeable odors. The average dosage for the year was 3.6 pounds per million gallons, but the actual use was limited to approximately three months with doses of 10 to 20 pounds per million gallons applied at first to the water entering the carbonating basins after sedimentation. Later it was found that equal results could be obtained when the powdered activated carbon was applied with the other chemicals at the dosing well. The latter plan was then adopted, because it avoids interference with filter operation and prevents unsightly appearance of the filter walls and the water itself due to the fine, black powder.

WALTER REID,
Superintendent of Water Works.

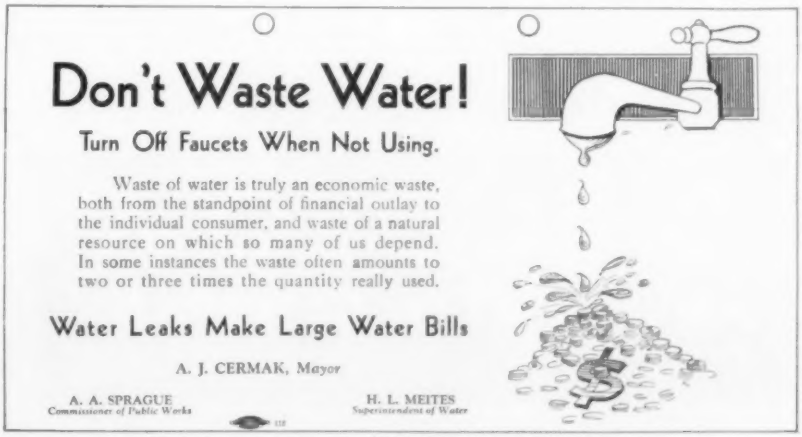
Benefits of Elevated Tank and New Well

WATER-WORKS improvements have recently been completed by Geneva, Ill., including a new well, a pump and an elevated steel tank. The installation is a good example of the proper location for additional water supply and storage in a growing city. Geneva is situated on the Fox River about 38 miles west of Chicago, and has an area of 3 square miles and a population of about 4,600 people.

The main pumping station is on the west bank of the river, near the center of the city. Previous to the installation of the elevated tank, the city pumped direct into the mains. A 280,000-gallon reservoir at the pumping station provided storage at ground level. The new 300,000-gallon Chicago Bridge & Iron Works ellipsoidal-bottom elevated tank is in the northwest corner of the city, about one mile from the pumping station and on the other side of the main residential section from it. By locating the tank and well in this manner, water feeds into the residential section from two directions. It is not necessary to pump all the water for the section through the mains from the pumping station side. The advantage of feeding from two ways instead of one is that it reduces the friction head loss against which the pumps must work. Variations in pressure in the system are smaller. The mains will not require re-laying for some time, for they need only handle average loads.

The distribution system at Geneva consists of one mile of transmission mains and twenty miles of distribution mains. There are 273 fire hydrants in the system.

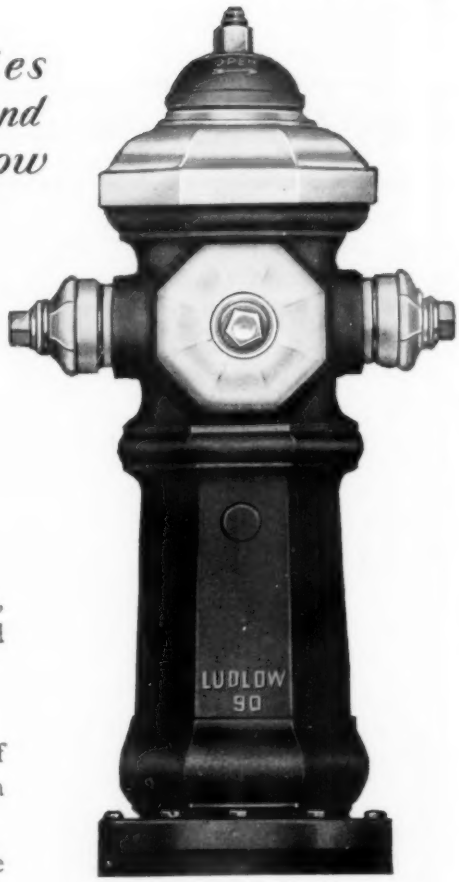
CARL I. HELLSTROM,
Superintendent of Water Works.


Don't Waste Water!
Turn Off Faucets When Not Using.
Waste of water is truly an economic waste, both from the standpoint of financial outlay to the individual consumer, and waste of a natural resource on which so many of us depend. In some instances the waste often amounts to two or three times the quantity really used.
Water Leaks Make Large Water Bills
A. J. CERMAK, Mayor
A. A. SPRAGUE
Commissioner of Public Works
H. L. MEITES
Superintendent of Water

THE POSTER USED IN CHICAGO'S WATER-WASTE WAR

For the Cities of Today and Tomorrow

Start with LUDLOW *this Spring*



When spring repair and replacement requisitions are placed, the specification of Ludlow Diamond Fire Hydrants and Ludlow Gate Valves will pay because:—

1. *Initial cost* is in line with current price levels.
2. *Maintenance cost* is almost negligible (an average of 2 cents per year per unit on over 8,000,000 units now in active use).
3. *Mechanical design* is most highly developed — the result of 66 years of experience.
4. *Appearance* — of the Ludlow Diamond Hydrant — is in keeping with modern trend in design and is a credit to any city.

THE LUDLOW DIAMOND FIRE HYDRANT combines the mechanical advantages of improved non-flooding valve, ground line coupling flange, tested materials and precision manufacture with the self-illuminating feature and modern design which can be instantly appreciated even from the illustration. A special folder describes the many advantages of this new hydrant.

LUDLOW GATE VALVES in iron, bronze or steel, up to 78″; designed for water, steam or other fluids; with or without spur or bevel gearing, hand-holes, by-passes, etc., as circumstances require, are available from stock for almost every type of requirement. The original producers of Gate Valves, Ludlow's experience assures proven construction in this important field.

TEST LUDLOW PRODUCTS · · THEY WILL MAKE GOOD

The LUDLOW VALVE MFG. COMPANY
TROY · · · · NEW YORK

TRADE LUDLOW MARK

PRODUCTS

Fire Hydrants Double and Single Gate Valves
Air, Check and Foot Valves Sluice Gates
Power Operated Valves

Water Meters Aid Revenue

Items on Advantages of Meters

Selma, Ala.

THE population of Selma remained stationary at 18,000 for the years 1900, 1910 and 1920. Throughout these years the system was 100 per cent metered and the average daily per capita consumption was 50 gallons. In 1930 the population increased to 19,000, the system was 100 per cent metered, and the consumption remained at 50 gallons per capita. In 1932 the population remained the same, the system was still 100 per cent metered, and the daily consumption increased to 53 gallons per capita. The pumpage for the year ending April 30 was 297,631,000 gallons in 1930, 290,011,000 gallons in 1931, and 346,436,000 gallons in 1932.—SELMA WATER WORKS COMMISSION.

Tucson, Ariz.

SINCE 1922 the Water Department of Tucson has installed 2,872 metered services and has metered 1,882 flat-rate services. This has increased the per cent of metered services from 44.2 in 1922 to 91.2 in 1932. During this time the receipts per thousand gallons pumped have increased from $0.08281 to $0.16865, while the per capita daily consumption has decreased from 201.9 to 120.0. The per capita figures are based on Government census population taken at 22,750 in 1922, increasing at the rate of 4.7 per cent per year to 36,000 in 1932. Metered water rates during this entire period have been: minimum monthly charge, $1.50; all water used between monthly meter readings in excess of 5,000 gallons, at the rate of 12 cents per thousand gallons. The total expenditures for meters during this ten-year period have been as follows:

Meters for 1,882 flat-rate services.....	$33,900
Meters on 2,872 new services.....	40,200
Inspection, repair and replacing of meters	19,300
Meter readings, posting bills, etc.....	55,800
Total expenditures.....	$149,200

During this ten-year period the total pumpage averaged 5.05 mgd.

Since 1922 all services installed have been metered and existing flat-rate services have gradually been metered. If, instead of following this policy, no meters had been installed after 1922 and all new services had been installed on a flat-rate basis, according to careful calculations based on comparative consumptions by flat-rate and metered users, the pumpage in Tucson would have averaged approximately 6.90 mgd. Since 1922 the electric energy and fuel oil costs have averaged $25.79 per million gallons pumped. Thus, metering has meant a saving in power cost of $174,100 for this period.

Receipts for the last ten years were $2,251,600. If no meters had been installed after 1922 and new flat-rate installations had produced an income on the same basis as the old, the receipts would have been approximately $1,879,700. During this period metering has increased the revenue $371,900, or 19.8 per cent, at the same time decreasing the amount of water pumped 26.8 per cent. The net saving of $396,800 was due to the installation of 4,754 meters during ten years at a total of 20,240 meter years. This means that each meter paid for its original cost and installation plus maintenance, reading and billing after the installation and benefited the Department to the amount of $19.60 each year it was in service.—L. R. BURCH, Office Engineer, City Water Department.

Ontario, Calif.

IN 1930, with a population of 13,582 and with both domestic and industrial services 100 per cent metered, the average daily per capita consumption of Ontario, Calif., was 165 gallons.—AUSTIN BURT, Superintendent, Water Department.

Alamosa, Colo.

THE water works of Alamosa operated from 1911 to 1915 on a flat-rate basis and the water consumption was 57.5 gallons per capita daily. Following the installation of meters at that time, there has been sufficient water to serve the city abundantly. In 1920 with a population of between 3,500 and 4,000 and the domestic services 95 per cent metered and industrial services 100 per cent metered, the daily consumption was 35 gallons per capita. In 1932 the population had increased to 5,200, the domestic and industrial services were 98 and 100 per cent metered, respectively, and the daily consumption was 35 gallons per capita.—R. C. BOLLIER, Superintendent, Water Department.

Denver, Colo.

DENVER is not sufficiently metered to determine any savings which may be due to this means of protecting the water supply. The city is not metered because of the water rights granted to protect the water for future use. Up to 1920 only 1½ per cent of the industrial services were metered and none of the domestic, and from that time on 2 per cent of the industrial services were metered. In 1900, with a population of 140,000, the daily consumption was 235 gallons per capita; in 1910, with a population of 230,000, the consumption was 213 gallons per capita; in 1920, with a population of 272,000, the consumption was 195 gallons per capita; in 1930, population 326,000, consumption was 208 gallons per capita; in 1932, population 330,000, consumption was 195 gallons per capita.—GEORGE F. HUGHES, Secretary, Board of Water Commissioners.

Middletown, Conn.

THERE has been no cash saving in Middletown due to the installation of meters, for the supply is a gravity one; but if meters had not been installed, a new reservoir would have been necessary, since the supply by 1915 was becoming depleted. In 1914, the population was 15,000. There were no meters and the average daily consumption was 135 gallons per capita. In 1915, with the same population, the system was 100 per cent metered, both domestic and industrial services being included, and the daily consumption dropped to 55 gallons per capita. The 1930 population was 18,000, with 100 per cent metering, and the daily consumption was 90 gallons per capita. The population increased to 18,500 in 1932, the city was 100 per cent metered, and the daily consumption continued at 90 gallons per capita. Prior to the time meters were installed, the consumption was about 2,000,000 gallons per day, and after meters were installed, it dropped to 800,000 gallons per day—G. ALLEN SCHAEFER, Superintendent, Public Works.

East Point, Ga.

THE population of East Point, Ga., has increased steadily since 1910. In the same time the percentage of services metered has increased from 50 to 100 and the average daily per capita consumption of water has decreased. In 1910, when the population was 4,500, 50 per cent of the domestic services were metered and 100 per cent of the industrial services metered. The average daily per capita consumption was 300 gallons. In 1920, with a population of 5,500, and 60 per cent of the domestic services and 100 per cent of the industrial services metered, the consumption had dropped to 275 gallons per capita. In 1930, the population had increased to 9,500, the domestic services to 75 per cent metered, the industrial services remaining 100 per cent metered, and the per capita consumption had decreased to 200 gallons. In 1932 the population had increased to 15,000 and all services, both domestic and industrial, were metered. This resulted in a reduction of the daily per capita consumption to 175 gallons. The actual cash saving to the Water Department has been in electric energy for pumping. The difference between the current consumption in 1930 and in 1932 was a reduction of about 25 per cent.—C. E. HUTCHESON, Superintendent, Light and Water Department.

For Municipal Pools
Perchloron

Use this new, highly concentrated powder that contains over 70% available Chlorine. Progressive municipalities find that it is especially adapted for use as a disinfecting solution in swimming pools and water, because it keeps water safe at all times at extremely low cost.

You are always sure of a uniform solution with Perchloron . . . because its stability is unquestioned. Perchloron can be used in any pool . . . regardless of type or size. It requires no technical supervision and is packed in convenient cans . . . one dozen cans to the case.

Chemicals for Industry

CAUSTIC SODA
BLEACHING POWDER
CHLORINE
ACIDS

EXECUTIVE OFFICES, WIDENER BLDG., PHILADELPHIA, PENNA.

Branch Sales Offices: New York, Pittsburgh, Chicago, St. Louis, Wyandotte, Mich., and Tacoma, Wash.

Works: Philadelphia and Natrona, Pa.; Wyandotte and Menominee, Mich.; Tacoma, Wash., Tacoma Electrochemical Co.

During February we hope you will remember to mention THE AMERICAN CITY

Construction and Maintenance

Engineering and Highway Departments

Vitrified Brick on Experimental Highway in Maryland

EXPERIMENT No. 6, the most northerly portion of the Connecticut Avenue experimental road of Chevy Chase, Md., was constructed of vitrified brick on a foundation of 1:3:7 gravel concrete. The entire surface was constructed during the spring of 1913. On the concrete foundation a cushion of sand was spread, rolled with a 300-pound roller and struck off to a true depth of 2 inches. The brick were laid in straight courses at right angles to the curb, and the surface was rolled with a 5-ton tandem roller until the brick were firmly bedded in the sand cushion. The joints were filled with two applications of 1:1 portland cement grout, the first application being swept into the joints and the second squeegeed over the pavement. Immediately after completion of the grouting, sand was spread over the pavement to a depth of ½-inch and kept wet for seven days. This procedure differed from modern methods in the thickness of the sand cushion and the use of cement rather than bituminous grout in the joints. In brick pavements today the sand cushion is seldom more than 1 inch thick.

Longitudinal joints were provided along each curb, but no transverse expansion joints were constructed, and the ends of the pavement were practically fixed.

The experiment was constructed with brick obtained from many sources and of widely differing characteristics. They were laid in 14 subsections, A to N. The cost of the surface, including the concrete base, was $2.58 per square yard.

Sections K, L, M and part of N were constructed over a heavy fill which some years ago settled to a considerable extent, causing failures in the overlying pavement and necessitating heavy repairs during 1919, 1920 and 1922. The fill has continued to settle and maintenance costs on these sections have been high. Such costs are not properly chargeable to surface maintenance and have not been included in the computations of maintenance charges.

A foundation failure occurred also at the junction of this experiment and the adjoining concrete pavement. This was apparently caused by the expansion of the concrete, and the brick on a strip 2 feet wide are cracked and worn. The brick of section N are rough and badly worn.

There has been little or no transverse cracking, although a considerable number of fine longitudinal cracks have developed and in some cases extended through several sections. They seem not to have affected the behavior of the wearing surface. Except for the repair of defects directly caused by subgrade and foundation failure, maintenance on this experiment has been confined to the filling of these cracks with bituminous material. The cost of such maintenance as to date for the entire period from 1913 to 1932 has amounted to 20.10 cents per square yard.

The brick section remains in excellent condition, showing little wear and no indication of failure under a traffic of approximately 3,000 vehicles per day.

—From a report of the U. S. Bureau of Public Roads.

Airports and Landing Fields in the United States

THERE were 2,117 airports and landing fields in the United States on January 1, 1933, an increase of 80 since July 1, 1932, according to a report of the Aeronautics Branch, U. S. Department of Commerce. A total of 701 of the airports on record January 1 were fully or partially lighted for night use.

On July 1, 1932, there were 543 municipal and 610 commercial airports; 352 Department of Commerce intermediate landing fields, 430 auxiliary fields, 51 Army and 14 Navy airdromes and stations; and 37 miscellaneous Government, private and state airports and landing fields, a total of 2,037. On January 1, 1933, the division was as follows: 549 municipal, 621 commercial, 352 intermediate, 476 auxiliary, 51 Army, 15 Navy and 53 miscellaneous Government, private and state airports and landing fields, totaling 2,117.

California led all other states in the number of airports and landing fields on January 1, having a total of 175, and Texas was second with 148. Pennsylvania, with 110, occupied third place. California, besides having the largest total, had the largest number of municipal airports, 53. Pennsylvania led in number of commercial airports, with 66. Alaska had the largest number of auxiliary fields, 68.

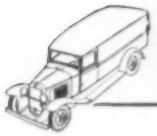
The report on municipal airports and landing fields is as follows: Alabama, 6; Alaska, 5; Arizona, 13; Arkansas, 12; California, 53; Colorado, 12; Connecticut, 6; Delaware, none; District of Columbia, none; Florida, 28; Georgia, 15; Idaho, 14; Illinois, 9; Indiana, 7; Iowa, 9; Kansas, 17; Kentucky, 3; Louisiana, 9; Maine, 2; Maryland, 1; Massachusetts, 4; Michigan, 28; Minnesota, 8; Mississippi, 9; Missouri, 8; Montana, 15; Nebraska, 10; Nevada, 3; New Hampshire, 5; New Jersey, 5; New Mexico, 6; New York, 18; North Carolina, 9; North Dakota, 11; Ohio, 14; Oklahoma, 23; Oregon, 17; Pennsylvania, 9; Rhode Island, 0; South Carolina, 7; South Dakota, 6; Tennessee, 8; Texas, 47; Utah, 4; Vermont, 3; Virginia, 11; Washington, 13; West Virginia, 1; Wisconsin, 18; Wyoming, 8. Total, 549 as of January 1, 1933.

Vitrified Paving Brick Simplified Practice Continued

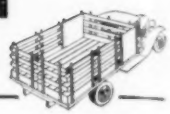
THE revised simplified practice recommendation Number 1-32, covering vitrified paving brick, has been accorded the required degree of acceptance by all interests in the industry, according to an announcement by the Division of Simplified Practice of the Bureau of Standards, Department of Commerce. In the revised schedule, which was prompted by the results of a survey conducted by the standing committee of the industry, the 4 x 3 x 8½-inch vertical fiber lug brick has been included, and the 3½ x 4 x 8½-inch vertical fiber lugless brick has been eliminated. The former size represents 22.6 per cent of the 1931 shipments of vitrified paving brick, while the latter averaged, during the past four years, less than 3 per cent. With these changes the new list of six recognized stock varieties will cover 75.9 per cent of the total shipments, as compared with 56.1 per cent for the previous list.

This simplification program, which was originally suggested and developed by the vitrified paving industry in 1921, has been reviewed by the standing committee on eight occasions. The most recent revision is effective from December 1, 1932.

AN 18-YEAR-OLD BRICK STREET IN MEADVILLE, PA., LEADING TO AN INDUSTRIAL DISTRICT



CHEVROLET



OFFERS A GREATLY IMPROVED

LINE OF SIX-CYLINDER

TRUCKS SELLING AT

GREATLY REDUCED PRICES

■ From Chevrolet . . . world's largest builder of automotive transportation . . . comes an improved line of six-cylinder trucks. Stronger. More durable. *Even more economical* than ever. And *selling at new reduced prices as low as $440.*

These reductions apply on every one of the 28 body-types, and place Chevrolet trucks in the most attractive price-position in their history. The 1½-ton 157-inch stake truck now sells for $70 less than last year. The 1½-ton panel for $40 less. The half-ton panel for $20 less. Compare these prices, then compare *what you get* for these prices—and you won't be satisfied to accept any other low-priced truck but a Chevrolet for 1933.

The new truck engine is basically the same reliable power plant of last year—*made even smoother, more powerful and more economical* by the addition of many new improvements and refinements. The new rear axle is bigger, heavier and more rugged. In addition, Chevrolet offers more than a hundred other new factors of ruggedness, endurance, and economy throughout the chassis. And the appearance of the truck has been smartly enhanced by the adoption of a new radiator, new headlamps, new fenders and, on many models, new body-lines!

When a truck as good as the Chevrolet was last year, offers all these *added* improvements, plus greatly reduced prices, there's no question as to who builds the best truck value for 1933! Again this year, it's *Chevrolet —for lowest transportation costs.*

CHEVROLET MOTOR CO., DETROIT, MICH.

REDUCTIONS AS MUCH AS $70

Half-Ton Pick-Up	$440
Sedan Delivery	$545
Half-Ton Panel	$530
131" Stake	$655
157" Stake	$715

All prices f. o. b. Flint, Michigan. Special equipment extra. Low delivered prices and easy GMAC terms.

CHEVROLET

A GENERAL MOTORS VALUE

AMERICA'S MOST ECONOMICAL FARM TRUCKS

Sewage Treatment Means Clean Streams

SEWERAGE and SEWAGE DISPOSAL

YOUR CITY'S SEWERAGE SYSTEM CAN PAY FOR ITSELF!

Burdening property with taxes for sewerage service is a method which unduly penalizes certain property owners and permits others to escape paying their fair share of the cost.

Every home, hotel, store or factory can pay for sewage removal at a rate which will pay the cost of the service.

Awake to the need for reducing property taxes and for putting service charges where they belong, 107 cities in this country are now using the sewer rental system. Of these cities 46 are in Texas, 19 in Ohio, nine in New Jersey, six in Massachusetts, and the balance in North Carolina, Virginia, Pennsylvania, Alabama, Mississippi, New Mexico, Arkansas, Connecticut, Kansas, Maryland, Michigan, Missouri, New York, and Oklahoma. The states of Indiana and Iowa have recently enacted such statutes.

A revision of the present Wisconsin statute is necessary before Wisconsin municipalities can place their sewerage systems upon a self supporting basis, and the League is supporting such a legislative measure.

A sewer rental law will make financing of sewer extensions and disposal plants much easier.

Loans of federal funds (through the Reconstruction Finance Corporation) for construction of waterworks and sewerage projects can be obtained only where the loans can be retired by income derived from reasonable service fees.

League of Wisconsin Municipalities

THE MANNER IN WHICH THE WISCONSIN LEAGUE OF MUNICIPALITIES ADVERTISES THE SELF-SUSTAINING CHARACTER OF SEWERAGE SYSTEMS

Operating Trickling Filters

THE three acres of trickling filters of the sewage treatment plant at Schenectady, N. Y., operated under the most adverse conditions ever imposed on trickling filters during 1931. The underdrains of the beds were submerged by high river levels on 236 days, or 64.7 per cent of the time. During April, May and November of that year the filters were sealed from under-aeration on 28 days each, and on 7 other months this condition obtained on more than half of the days. The average days of submergence of underdrains was 19 per month. On many days a large proportion of the bed depths were submerged and septic conditions existed, since the filter effluent remained in the media.

In spite of adverse conditions, the filters succeeded in producing a final effluent with an average stability of 80.4 per cent. Monthly averages of the effluents of the three independent sets of filters varied from 97.8 per cent in November to 46.2 in June, directly after the severe underdrain submergence of April and May. The bed efficiencies were high in the winter months. This is accounted for by the low river levels and the good aeration through the beds.

Fly control was carried out by flooding. Because of favorable conditions, fly development was rapid, and it was found necessary to submerge the beds practically every week during the worst months. The total floodings amounted to seventeen for the entire fly season in 1931.

Besides the floodings for fly control, an original method of auxiliary psychoda control was devised. This method consists of burning the flies settling on the gallery walls, around the gallery stair enclosures and in the tall grass that grows around the filters. The flaming was carried out with a portable oil-burning torch outfit consisting of a fuel pressure tank, a hose line and a torch. The torch has been operated by two men and also by one man. In the two-man operation one man trundled the pressure tank along the gallery top on a two-wheeled truck while the other man carried the burning torch along the gallery walls and singed the flies with a sweeping motion. With the one-man method of flaming, the pressure tank was attached to the same truck, while the torch was swung out over the gallery wall by means of an adjustable arm. As the truck was moved along the gallery, the flame shot down the wall and killed the flies. The flame developed a temperature of 2,000 degrees F. With but 2½ gallons of fuel oil needed to flame 7,200 square feet of gallery walls, the cost for flaming the area was 20 cents, or 2.8 cents per 1,000 square feet of area. A small hand torch was also used for fly flaming.

MORRIS M. COHN,
Sanitary Engineer, Bureau of Sewage Disposal.

Indiana Makes Sewerage Works "Self-Liquidating"

AT the end of its special session, the Indiana Legislature, on August 13, 1932, passed the McKesson-Crawford bill, under which sewers and sewage-disposal plants may be built and operated by municipalities on the basis of service charges collected from the users. This should make it possible for Indiana cities to secure money from the Reconstruction Finance Corporation for this work, to be repaid from revenues received. The bill was introduced at the request of a number of cities that wished to act under its provisions at once.

A total of nine states have now passed enabling acts to make sewerage works "self-liquidating," and bills are being prepared in a dozen more for the coming legislative sessions.

A Three-Ring Brick Storm Sewer in Denver

AN engineering job of considerable magnitude is just being completed in Denver, Colo., in the Park Hill 120-inch 3-ring brick storm sewer. The Park Hill and City Park districts, two of the finest residential districts in Denver, have always been subject to flooding in times of heavy rainfall, due to inadequate facilities for running off the excess precipitation which normally occurs from two to five or six times during the summer months. The Park Hill storm sewer will relieve this situation and prevent flooding of streets, basements, and property in these districts, and will carry the surface water underground to the mouth of the sewer where it empties into the Platte River. The contract was awarded to the Construction Service, Inc., and Associates, a Denver contracting firm, at a price of $1,740,293.37, and portions of the job have been sublet to other Denver contractors.

The total length of the sewer and branches is slightly over 15 miles, there being in the neighborhood of one-quarter mile of open trench, one mile of 120-inch 3-ring brick, 1½ miles of 144-inch 3-ring brick, and nearly one mile of 108- to 102-inch 3-ring brick sewer. For inside diameters of 90 inches down to 24 inches, which is the smallest, the sewer is built of pre-cast concrete pipe.

Most of the territory through which the sewer extends is in dry, sandy soil, but in certain portions some rock is encountered. The Lawrence Construction Co., one of the subcontractors, which is placing 90-inch and 84-inch precast concrete pipe in a trench 26 feet deep, encountered a bed of sandstone varying in thickness from 3 to 12 feet. When this was first met, it was presumed that blasting would have to be resorted to, but this was not necessary, for they were successful in breaking out the sandstone with Gardner-Denver Model 15H paving breakers and 5-inch chisels. Most of the time they used three breakers and one sheeting hammer at the same time, with a 240-ft. G-D portable compressor supplying the air for all four machines. This work is a very severe strain on the paving breakers, and the four machines kept the compressor operating at capacity in the mile-high altitude of Denver.

Virtually all of the sewer was constructed by the "open-cut and back-fill" method, but at one point it was necessary to construct a tunnel some 300 feet in length under the switch yards of the Union Pacific Railway to carry the 120-inch sewer. This portion of the job entailed some particularly fine engineering work on the part of the contractors, and it was successfully completed.

D. B. SEELEY.

Sewerage works are self-sustaining where service charges are made. Hence cities may provide local employment with R. F. C. funds for such projects under the "self-liquidating" provision.

● THROTTLING THE Fire Demon of the Coal Pile

AS a crane unloads a barge on the storage pile, the "Caterpillar" Tractor with bulldozer spreads, smooths and compacts the coal into a 2-foot layer. The "Caterpillar" then pulls a heavy railroad rail over the layer to compress and settle the screenings more firmly together. As layer is packed on layer, the air is so effectively removed that there is seldom enough oxygen left in the pile to allow a spontaneous combustion fire to start.

The marks of the broad tracks show what positive traction the "Caterpillar" Tractor has — to travel steadily over the loose footing. And it has ample power to handle and place big blades full of screenings. This outfit has leveled and compacted as much as 8000 tons of coal in a 10-hour day!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.
Track-type Tractors Combines Road Machinery
(There's a "Caterpillar" Dealer Near You)

Prices — f. o. b. Peoria, Illinois

FIFTEEN	$1,100	FIFTY	$3,675
TWENTY	$1,450	DIESEL FIFTY	$4,500
TWENTY-FIVE	$1,900	SEVENTY	$4,750
THIRTY-FIVE	$2,400	DIESEL SEVENTY	$6,250

CATERPILLAR
REG. U. S. PAT. OFF.
TRACTOR

WALTER L. ANDERSON
County Engineer, O'Brien Co.
Primghar, Iowa
(Appointed 1922)

A. F. GREEN
City Engineer
Lonaconing, Md.
(Appointed 1920)

MONROE H. BRYANT
County Engineer, Jefferson Co.
Fairfield, Iowa
(Appointed 1919)

JAMES C. McCLEAN
County Engineer, Woodbury Co.,
Sioux City, Iowa
(Appointed 1916)

ELMER W. PRINCE
City Engineer
Morgantown, W. Va.
(Appointed 1927)

Who's Who in City & County Engineering

One of a Series of Portraits of Engineering Officials Which Has Appeared Monthly Since April, 1928

RALPH COCHRAN
County Surveyor, Shelby Co.
Shelbyville, Ind.
(Elected 1929)

A. H. MARTIN
County Engineer, Costilla Co.
San Luis, Colo.
(Appointed 1904)

GLEN R. BLACKBURN
City Engineer
Corpus Christi, Texas
(Appointed 1929)

BLAIR BOYLE
County Engineer, Cowley Co.
Winfield, Kans.
(Appointed 1926)

K. V. HARRIS
City Engineer
Texarkana, Texas
(Appointed 1928)

D. M. SULTZ
County Engineer, Elbert Co.
Kiowa, Colo.
(Appointed 1920)

WILLIAM E. BALDRY
City Engineer
Topeka, Kans.
(Appointed 1917)

ORIN E. METCALFE
City Engineer
Austin, Texas
(Appointed 1926)

FLOYD CAPWELL FREAR
County Roadmaster, Douglas Co.
Roseburg, Ore.
(Appointed 1920)

Diesel Power Hydraulic Control 6-Speed Drive

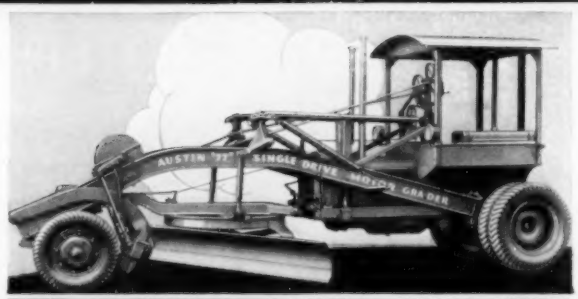
"77" Motor Graders steal every show . . .

Build a Motor Grader with greater power—better traction—wider speed range—increased ease of control! That was the order given Austin-Western engineers.

Their achievement is the new Austin "77" Motor Grader, Dual and Single Drive, first announced at the Detroit Road Show. Here, as wherever shown, it sets the pace in road grading machinery.

DIESEL POWER Now the proven economy of Diesel motor power lowers the cost per mile of grading operations. So great are the savings from the greater mileage per gallon of fuel and from the use of low cost fuel oil, that they will more than pay for the replacement of old wasteful equipment. Diesel engine, as optional equipment, is an exclusive feature of Austin "77" Dual Drive Motor Graders.

HYDRAULIC CONTROL Extreme ease of operation is accomplished by hydraulic controls, optional equipment on both the Dual and Single Drive "77" Motor Graders. Action is smooth, positive and rapid. The few moving parts run in oil and are completely dust sealed.



New EQUIPMENT • IMPROVEMENTS • VALUES

6-SPEED DRIVE Six speeds forward and two in reverse provide flexibility of operation to meet every condition. High speeds for light work and traveling with fuel economy. Low speeds to pull smoothly through the heaviest going.

EXTRA-WIDE FRONT TREAD Improved resistance to side-draft, added steering stability and easier handling are secured through the use of a new front axle with wider tread. In light ditch work, the inside wheel runs on the firm road and maintains perfect tracking with the drive wheels.

Write for the new bulletin completely describing these and many other features. The Austin-Western Road Machinery Co. Home office 400 North Michigan Avenue. Branches in principal cities.

102

The Austin-Western ROAD MACHINERY CO.

ROAD ROLLERS, CRUSHING & SCREENING PLANTS, SCARIFIERS, SWEEPERS & SPRINKLERS, ROAD GRADERS, ELEVATING GRADERS, MOTOR GRADERS, PLOWS & SCRAPERS, BITUMINOUS DISTRIBUTORS DRAGS, SHOVELS & CRANES, DUMP WAGONS, SNOW PLOWS.

METHODS and COSTS of REFUSE COLLECTION and DISPOSAL

Reducing the Garbage and Refuse Budget

SOME months ago when the budget for the present fiscal year for the city of Buffalo, N. Y., was being considered, there was a universal demand that a substantial reduction be made in the city operation and maintenance costs, which in the last previous budget totaled $31,495,117.75. According to the weekly bulletin of the Buffalo Municipal Research Bureau, Inc., the Mayor reduced this item by $539,887.45, and the Council made further changes, bringing the final reduction to some $2,250,000. While even the total reduction was less than that strenuously advocated by the individuals and taxpaying groups who were most active, there was a general feeling that the responsible officials had at least recognized the need for retrenchment and had honestly made efforts to afford substantial relief.

To secure this reduction, appropriations for various services were cut, and the largest single cut was made in the amount allowed for the collection of ashes, garbage and refuse. In the 1931-32 budget the total appropriation for this service was $974,624.15. In the 1932-33 budget the amount allowed by the Council was $655,500.00, a reduction of $319,124.15, or approximately 33 per cent. This was almost entirely for wages, as shown below:

Wages	1931–32 Budget	1932–33 Budget	Decrease
Assistant foremen	10,329.00	$ 12,000.00	$ 1,671.00*
Wagon drivers	312,000.00	200,000.00	112,000.00
Truck drivers	45,700.00	25,000.00	20,700.00
Truck drivers' helpers	21,500.90	12,000.00	9,500.00
Lifters and carriers	395,859.00	278,000.00	117,859.00
Rollers-out	186,500.00	125,000.00	61,500.00
Laborers—storehouse	1,550.00	1,700.00	150.00*
Watchmen—storehouse	700.00	1,200.00	500.00*
Expense materials	486.15	600.00	113.85*
Total	$974,624.15	$655,500.00	$319,124.15

* Increase.

Obviously, a reduction of that amount demanded a reorganization of the service, for unless the Council reduced the rate of wages, it would be impossible to continue to employ the same force as before. But the rates paid to city employees are fixed by city ordinances, and the Council has made no change in the ordinances governing the various rates here involved.

The Division of Streets, to solve its problem, proposed at first to lengthen the collection periods, and a protest arose which was loud if not widespread. Collection of garbage during the summer months at ten-day intervals, it was held, would afford a serious menace to the public health. The protesting element was emphatic in its demand for the same schedule of collections as in the past. Then the Division of Streets announced that the old schedule would be maintained but householders would have to bring their cans to the curb and return them to their yards or cellars. While some have grumbled at this, the majority of citizens, it is safe to assume, accept it as best under all the circumstances. There is, however, one obvious phase of this problem which seems to have been wholly overlooked or ignored, according to the Buffalo Municipal Research Bureau, namely, that a proper reduction in the rates of wages paid to the force employed would enable the Division to carry on this work without any curtailment of force or service. This could be brought about by changing the existing ordinances governing the wage rates, a matter in which the Council and the Mayor must take the initiative.

At present, as for several years past, the rates established by ordinance for the weekly payrolls of this collection service have been as follows:

Ash and garbage drivers	$6.00 per day
Lifters and carriers	5.50 per day
Rollers-out	5.50 per day

The men who work eight hours per day six days each week receive in the case of lifters, carriers and rollers-out a rate of approximately 68 cents per hour. Their work must be classed as common labor, and the prevailing rate of wages for common labor wherever employed in Buffalo, except on the city's payroll, is away below 68 cents per hour. An investigation by the Buffalo Municipal Research Bureau in January, 1932, showed the prevailing rate at that time to be about 40 cents per hour in private employ.

Had the Council followed its budget reduction in the total allowance by changes in the ordinances that would have fixed the rates for the common labor in the collection service at, say, 47 cents per hour, many men employed last year, but now deprived of all income, could have been kept employed, with the service undisturbed.

This is a time when the demand is for work and no one hesitates in his choice between work at a reduced wage and no work at all. It is the aim of private industry during this trying period so to spread the work available that the maximum number can receive some living compensation, rather than to maintain past salaries at the cost of dropping completely many of their employees.

NUMBER OF MAN-HOURS OBTAINABLE AT STATED HOURLY RATES FOR LIFTERS, CARRIERS AND ROLLERS-OUT

Year	Appropriation	Rate per Hour	Man-Hours Obtained
1931–32	$582,359	68 cents	856,410
1932–33	403,000	68 cents	592,646
1932–33	403,000	if at 47 cents	857,446

Closed Garbage Truck for Hempstead, N. Y.

THE nuisance of open garbage trucks passing through city streets, and the back-straining operation of lifting the container of garbage to the top of the truck body, have ceased in Hempstead, where all-steel sanitary enclosed bodies are now used. The loading bucket into which the garbage is emptied by the collectors is long enough, large enough and low enough to permit from one to three men to load garbage at the same time, and the loading height is only 30 inches.

The operating mechanism for raising the long trough up into the body for dumping is simple and noiseless. The bucket is operated by dual control. When it is full, either the driver or the loader presses a lever and the bucket automatically dumps its flow into the body and returns empty to await refilling. As the bucket extends practically the full length of the body, the load is evenly distributed throughout, and when the bucket is on the way up it also serves to close up the only remaining opening in the steel body. The bottom of the body is straight without sumps, permitting easy automatic unloading.

The body of this Collecto truck holds 10 cubic yards of garbage and is painted white. It has a rear discharge door which is made watertight for a depth of 1 foot 6 inches.

JOHN ESTERBROOK,
Street Commissioner.

Charlotte, Mich.

A contractor designated by the city removes all the garbage in the city of Charlotte, population 5,307, and is paid by the householder. The contractor uses one truck of 50-can capacity and disposes of the garbage by feeding to pigs. —L. B. FRACE, City Clerk.

Grand Haven, Mich.

The city of Grand Haven, population 8,345, awards a contract to one individual for the collection of garbage throughout the city. This contractor uses one truck for collection and is paid by the individual householder. The garbage is disposed of by taking outside of the city. —EDW. BAUMGARDNER, City Manager.

Thirteen GAMEWELL SPRINKLER WATCHMEN Gave THREE YEARS' PERFECT SERVICE at Lewiston, Maine

TELEPHONE 1398

Kirk Electric Co., Inc.
ELECTRICAL CONTRACTORS
APPLIANCES, FIXTURES AND REFRIGERATION
f BATES STREET

Lewiston, Maine, Apr. 29, 1932

The Gamewell Company
Newton, Mass.

Gentlemen:

Answering your letter regarding false alarms from Sprinkler Alarm Circuits such as we have installed here, will say that we have had this system in use in this city for three years now and have had no false alarms from same.

We have had alarms from sprinkler heads being knocked off by accident, and one box came in when a garage building full of cars collapsed which was a four-story brick block. About the only thing that was left was the box which, altho knocked off the wall, did not happen to break the conduit or circuit and it came in all four rounds O.K.

We have thirteen of these installations and the subscribers are well pleased with the system.

I hope this answers your letter and gives the information you wanted, and if not, write me on any particular thing you may want to know.

With best regards, I am

Yours truly,

K. A. Kirk.

Supt. Fire Alarm
Lewiston, Maine

Here is a three-year service record from Lewiston, Maine, that establishes the reliability of the Gamewell SPRINKLER WATCHMAN—not one false alarm from any of the entire thirteen installations in that city. Yet, during the same period several alarms from these SPRINKLER WATCHMEN enabled the fire department to prevent extensive water damage when sprinkler heads were knocked off by accident.

Many properties, large and small, have had the protection of the SPRINKLER WATCHMAN for several years. More sprinklered properties are now purchasing Gamewell master fire alarm boxes for this purpose because they provide the most direct, accurate and economical service available.

Taxpayers everywhere are scrutinizing carefully the expenses of the fire department along with those of other municipal divisions to determine what they are getting for their tax dollars. So, now is the time to show your leading taxpayers how to secure this added protection from the municipal fire alarm system and fire department for a small initial cost and no rental charges.

THE GAMEWELL COMPANY

"A BOX A BLOCK"

NEWTON, MASSACHUSETTS

Fire—Police—Safety Items

of Interest to Departments of Public Safety

Fire-Prevention Week Results

REPORTS of Fire-Prevention Week observances last fall have been compiled by T. Alfred Fleming, Chairman of the Committee on Fire Prevention and Clean-up Campaign, of the National Fire Protection Association, and show excellent results in reduced fire losses, according to the January News Letter of the N.F.P.A. The number of reports received and the effectiveness of the observances indicated is much greater than last year. The committee of judges, which has just reviewed the reports for United States cities, consists of Sumner Rhoades, President, N.F.P.A., H. T. Cartlidge, Chairman, Committee on Fire Prevention and Engineering Standards, National Board of Fire Underwriters, and Henry H. Heiman, Manager, National Association of Credit Men. The names of the cities receiving first and second places are given below:

State	*First*	*Second*
Alabama	Tuscaloosa	Mobile
Arizona	Tucson	Yuma
Arkansas	Pine Bluff	Fort Smith
California	Berkeley*	Fresno
	San Francisco*	
Colorado	Fort Collins	Denver
Connecticut	Hartford	New Britain
Delaware	Wilmington	
Florida	Ocala	Fort Lauderdale
Georgia	Savannah	Albany
Illinois	Belleville	Moline
Indiana	Fort Wayne*	Indianapolis
	Mishawaka*	
Iowa	Burlington	Mason City
Kansas	Topeka*	Hutchinson
	Wichita*	
Kentucky	Owensboro	Newport
Louisiana	New Orleans	Baton Rouge
Maine	Portland	
Maryland	Salisbury	Hagerstown
Massachusetts	Springfield	Worcester
Michigan	Fremont	Battle Creek
Minnesota	Hibbing	St. Paul
Mississippi	Jackson	
Missouri	Kansas City	St. Louis
Montana	Bozeman	
Nebraska	Lincoln	Omaha
New Hampshire	Concord	Manchester
New Jersey	Newark	Jersey City
New York	Newburgh*	Rochester
	Utica*	
North Carolina	Asheville	Gastonia
North Dakota	Valley City	Devils Lake
Ohio	Lakewood	Cincinnati
Oklahoma	Stillwater	Blackwell
Oregon	Marshfield	Portland
Pennsylvania	Wilkes-Barre	York
Rhode Island	Providence	
South Carolina	Charleston	Columbia
Tennessee	Memphis	Kingsport
Texas	Dallas	Amarillo
Utah	Brigham City	
Vermont	Springfield	
Virginia	Richmond	Norfolk
Washington	Colfax	Bellingham
West Virginia	Parkersburg	Bluefield
Wisconsin	Milwaukee	Oshkosh
Wyoming	Casper	
Hawaii	Hilo*	
	Honolulu*	

*Tied.

The following cities had a grade of merit of 90 per cent or over: Hartford, Conn.; Topeka and Wichita, Kansas; Kansas City and St. Louis, Mo.; Asheville, N. C.; Lakewood, Ohio.

Of the cities reporting in the United States, 77 suffered no loss by fire during the week of October 2 to 8. 76 escaped damage from burning during Fire Prevention Week, October 9 to 15, and 79 reported no fire loss throughout the following week. This is a total of 232 fireless weeks covered by the period of this special fire-prevention observance. The fire loss in the cities submitting such records, as compared with the average weekly loss of the same cities for the previous year, showed a reduction of 46 per cent.

Panicky Economy

EVEN as essential a service as fire protection is seriously menaced in some places by budget-paring zeal. A case in point is reported in the Springfield, Mass., *News* for January 10, in an item relating to Indian Orchard, a community near Springfield. It states:

"Local property owners have learned with regret that the sum of $7,500 recommended by the Fire Commissioners for connecting the local fire-alarm system with headquarters at Springfield had been cut out of the budget by the Mayor in making his report. Local people feel that this added protection is essential, as under the present system when the local fire fighters are out on call there is no other equipment on hand at the station to take care of any incoming alarms."

Heretofore when an alarm was sent in to the Indian Orchard station it would also be registered at Springfield headquarters, and a squad from that city would fill in at the local station.

Reducing Crime in St. Louis

MAJOR offenses in St. Louis, Mo., have shown a substantial decline in the last five years, despite the population growth of the city and the business depression, according to an interview with Police Chief Joseph A. Gerk in the St. Louis *Post-Dispatch* for December 22. Chief Gerk states that the crime decrease may be credited to increasingly efficient crime-prevention work, a standardized system of records by which police officials keep a close check on the activities of the patrolmen, and the assistance of the radio.

Crime-prevention work is aided by the Parole Bureau instituted in 1931, which assists in getting jobs for former prisoners and otherwise keeping them "straight"; by a friendly attitude of the police to boys and girls; and by cooperation of various welfare organizations.

The record system includes the daily radio log, the daily crime report and the holdover report, which enable the police administration to check the activities of the force.

Calling radio the finest gift of science to the policeman since the fingerprint system of identification, Chief Gerk says:

"We have 112 radio automobiles in the department; 95 or 96 of them are on the street all the time, kept in touch with the movements and activities of criminals by a radio station that is always on the job.

"This means that policemen get to the scene of crime in a matter of seconds, or a few minutes. There's always a cruiser or a scout car within a few blocks of any crime. It means that the first policeman who gets on the job knows he's going to have plenty of help and have it quickly. It means that the criminal must work swiftly if he is to get away. It means that we have been able to get hundreds of holdup men and other hoodlums at the very scene of the crime, and often in the act of its commission."

Fewer Traffic Deaths in 1932

A PRELIMINARY survey of accidental deaths in the United States in 1932, compiled by the National Safety Council, shows a 10 per cent drop in all such deaths, and a 13 per cent drop in motor-vehicle fatalities.

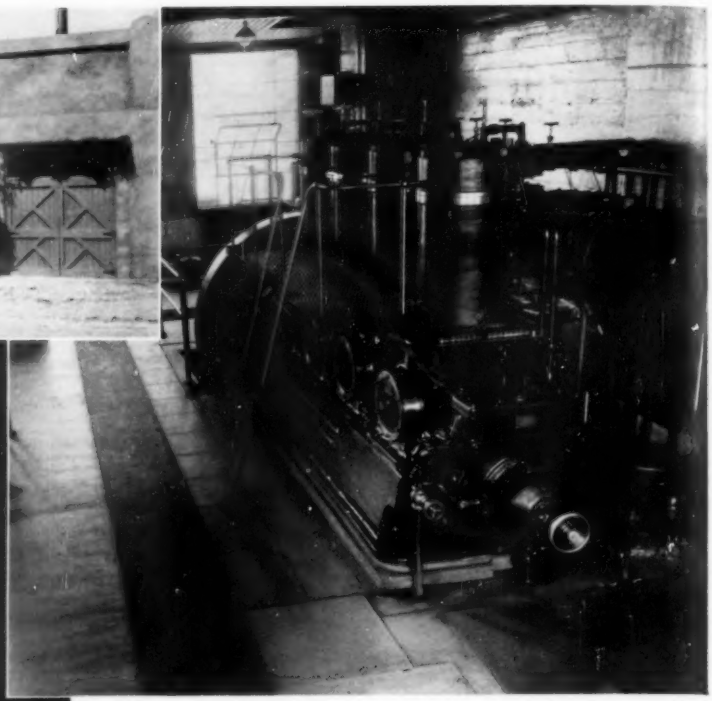
The fatality totals for the entire country are estimated as follows, on the basis of the reports from 23 states and the District of Columbia, with a total population of 64,000,000:

	1932	1931
Motor vehicles	29,500	33,740
Other public accident fatalities	18,000	20,000
Home	28,000	29,000
Industrial	15,000	17,500
	90,500	100,240

As reported in the New York *Herald-Tribune* for January 30:

"The new motor-vehicle death-rate of 23.6 is the lowest recorded since 1928, when the rate was 23.3. The 1931-32 percentage of decline in motor-vehicle deaths was about twice as great as the 6 per cent drop in motor-vehicle registrations, or the 6.84 per cent decline in gasoline consumption. Since these two factors are the best indicators of motor-vehicle travel, it seems certain that the 1932 drop in deaths is partly due to an advance in the safe use of streets and highways.

"Cities of more than 500,000 had a fatality drop averaging about 10 per cent, while smaller cities declined more than 15 per cent. Milwaukee has the lowest death rate among cities of more than 500,000. Rochester leads the second group and Peoria the third. Medford, Mass., population 64,300, is the largest reporting city to go through the entire year without a motor death."



WELLS, Minnesota
(pop. 1782)
Changes to F-M Diesel *and Saves*
$11,096.00
first year . . . . . .

CITY officials today are confronted with the problem of reducing expenses and essential city services or increasing revenue and maintaining these services—but without increasing taxes.

Wells, Minnesota, found the answer to its problem by replacing its steam-driven electric light and power plant with three Fairbanks-Morse Diesel Engine driven electrical units with a total capacity of 660 hp.

In the first year of the new plant's operation, *a net operating profit of $11,096.00 was earned.*

In city after city, Fairbanks-Morse Diesels are a source of much needed financial relief to the city treasury which means to the tax-paying citizen as well.

As America's largest manufacturer of Diesel Engines—with widespread knowledge of Diesel application to municipal needs—Fairbanks-Morse will gladly furnish you with data on what F-M Diesels will do for your city. Address Fairbanks, Morse & Co., 900 S. Wabash Avenue, Chicago, Illinois. 32 branches at your service throughout the United States.

FAIRBANKS-MORSE
DIESEL ENGINES

5851-OA98.80

POWER PUMPING AND WEIGHING EQUIPMENT

THE AMERICAN CITY should always be mentioned when writing for this material which is furnished free.

KEEP YOUR FILES UP-TO-DATE WITH CATALOGS

Keep your files up to date by checking over these items each month and writing for those you need.

BULLETINS ON WELL-WATER SYSTEMS

290. Layne & Bowler, Inc., Dept. B, Memphis, Tenn., will be pleased to send free bulletins on Layne pumps, wells and well-water systems of interest and value to city officials. This company has the reputation of being the world's largest water developer.

SNOW-REMOVAL METHODS AND EQUIPMENT

291. Caterpillar Tractor Co., Peoria, Ill., has published a very helpful booklet on snow-removal methods and equipment, which shows a wide variety of types of snow-plows made by different manufacturers and their adaptation to use with Caterpillar tractors. Snow-loading equipment for city streets is also shown, as well as sidewalk plows, rotary plows and ice levelers.

LONG LIFE AND LOW UPKEEP IN BRICK PAVEMENTS

292. The wisdom of building brick pavements with their low upkeep costs has been more clearly apparent in the past two years. In good times or in dull times, brick-surfaced roads serve the public well. Even veteran pavements 40-odd years old require little or no money from the treasury and the taxpayers. Brick is a thrifty, common-sense pavement. Nothing left to chance in constructing it. Completed, it is well-nigh indestructible. For further information about brick write to the National Paving Brick Assn., 1245 National Press Bldg., Washington, D. C.

NURSERY STOCK FOR CITIES

293. Shade tree commissions, park superintendents and other municipal officials should get in touch with Naperville Nurseries, Naperville, Ill., before buying nursery stock. The Naperville Nursery contains 400 acres and has a complete assortment of hardy transplanted ornamentals and native plant material, trees, evergreens, shrubs, perennials and rock garden plants. A catalog will be sent on request.

CORRECTLY DESIGNED ELEVATED WATER TANKS

294. R. D. Cole Mfg. Co., Newnan, Ga., is prepared to submit designs to meet any special requirements for elevated water tanks and towers, whether on buildings, in odd locations or simply requiring auxiliary units. Cole's Engineering Department has an experience of 56 years behind it and will be glad to co-operate as well as to furnish literature upon request.

MAKE SLIPPERY STREETS SAFE

295. Whether it is the ice of winter or the "slick" surface of summer, the Hercules-Ditwiler sand, cinder and chip spreader quickly and evenly covers the surface, making it non-skid. Full details of the small economical machine are available from The Ditwiler Mfg. Co., Galion, Ohio.

HEAVY-DUTY REVERSIBLE BLADE SNOW-PLOWS FOR MOTOR TRUCKS

296. Bulletin MS issued by the Monarch Mfg. Co., Inc., E. Front St., Wilmington, Del., describes and illustrates Monarch standard and heavy-duty reversible blade snow-plows for motor trucks, which may be attached to any standard make of motor truck of 1-ton capacity and up.

BUILD WATER PIPE WITH THE USE OF LOCAL LABOR

297. Why not give your own taxpayers and your own customers the benefit of your pipe-line dollars? Lock Joint pipe will help your unemployment situation by giving work to men in YOUR community. Thus the Water Department helps the community. Full details may be secured from Lock Joint Pipe Co., Ampere, N. J.

DEEP-WELL TURBINE PUMPS

298. The Johnston Pump Co., 2324 E. 49th St., Los Angeles, Calif., has issued a striking illustrated folder outlining all the features of the Johnston deep-well turbine pump, with special reference to Type K, which has a maximum 14-inch column, a maximum 12-inch outlet, and a maximum 250-horsepower motor for operation.

STEEL POSTS FOR MUNICIPAL AREAS

299. Sweet's steel posts, rolled from the highest grade carbon steel and easy to drive, which are self-contained and have a pleasing appearance and a high safety factor, are described in the catalog of Sweet's Steel Co., Williamsport, Pa.

HIGH-GRADE WATER METERS

300. A full line of high-grade water meters made by a big modern plant and with sixty years of experience in the meter business behind them are at your service. National meters are described in the literature of the National Meter Co., 299 Broadway, New York.

IMPORTANT DEVELOPMENTS IN ELEVATED STEEL WATER TANKS

301. Every year sees new cities added to the list of those that utilize Horton elevated tanks in their water-supply systems. The year 1932 has been noteworthy in the advances made in the design of tanks, particularly in two directions: first, the trend is still strongly toward shallow depth; and, second, more attention is being paid to the appearance of elevated tanks. The Chicago Bridge & Iron Works, 2127 Old Colony Bldg., Chicago, Ill., will gladly furnish information and estimates to assist you in selecting the type of elevated tank best suited to your needs.

ASPHALT PRODUCTS FOR STREET AND ROAD CONSTRUCTION

302. Socony brand asphalt products are standard in the paving industry. No matter what kind of bituminous paving you may have in mind, there is a Socony product made particularly for that purpose. Specifications and all particulars on Standard Socony brand asphalt products may be secured from the Standard Oil Company of New York, Inc., 26 Broadway, New York.

CAST IRON MAINS ARE TAX SAVERS

303. Cast iron mains are tax savers the world over. In Paris, London, Philadelphia, St. Louis and other important cities cast iron mains that were laid over 100 years ago are still in service, having saved francs and pounds and dollars for millions of taxpayers. By installing needed cast iron water mains now, your city can save money, relieve unemployment and help to revive business. For further information write to the Cast Iron Pipe Research Assn., Thomas F. Wolfe, Research Engineer, 122 S. Michigan Ave., Chicago, Ill.

GAS ENGINES FOR STAND-BY SERVICE

304. Sterling high-duty internal-combustion engines for standby service are able to stand up under the most severe operating conditions. Engineers have stated that they had not thought it possible for a gasoline engine to stand up under the tremendous strains which Sterling engines have withstood without any difficulty. Full information regarding Sterling gas or gasoline engines from 12 to 565 brake horsepower may be secured from the Sterling Engine Co., Dept. C-11, 1270 Niagara St., Buffalo, N. Y.

A MODERN ALLOY FOR CULVERTS

305. "The Path to Permanence," second edition, issued by the Republic Steel Corp., Youngstown, Ohio, discusses and illustrates the use of Toncan copper molybdenum iron, known as Toncan iron, for ducts, ventilators, roofs and the severe services of culverts.

ECONOMY IN STREET LIGHTING

306. The need for economy often tempts public officials to cut down street lighting and unwittingly expose their citizens to a costly increase in traffic accidents and crimes. True economy based on experience urges the installation of Holophane refractors in order to obtain the greatest amount of useful light from any given investment in Mazda lamps and current. Holophane bulletins on street and highway lighting may be secured from the Holophane Co., Inc., 342 Madison Ave., New York.

SPECIALS AND REGULAR CASTINGS

307. A half-century of intensive specializing, skilled labor is a combination hard to modernly equipped plants, and happy beat, and that is why so many so-called "specials" in other foundries are actually every-day routine in Lynchburg plants. Lynchburg steps up and makes your piping jobs more profitable. Full information regarding the Lynchburg service and quotations on "specials" may be secured from Lynchburg Foundry Co., Lynchburg, Va.

SELF-CALKING PIPE COMPOUND

308. Thousands of miles of cast iron water pipe in all sizes are jointed with Hydro-Tite, a dependable self-calking water compound. During 1931 over one hundred new names were added to the long list of Hydro-Tite users. If your name is not already on this list, investigate Hydro-Tite now by writing to the Hydraulic Development Corp., 50 Church St., New York.

LONG-LIFE METAL FOR LONG-LIFE CULVERTS

309. It is axiomatic that you cannot build long life into a culvert unless there is long life in the metal from which it is made. For almost a quarter of a century culverts made from Gohi 99.90 per cent pure iron-copper alloy have been giving an in-the-ground performance which is unequalled. Full facts may be secured from the Gohi Culvert Mfrs., Inc., Newport, Ky.

WINTER CONSTRUCTION EQUIPMENT

310. The Mohawk Asphalt Heater Co., Schenectady, N. Y., describes in Bulletin No. 15 its Hotstuf equipment manufactured to keep jobs going in cold weather, including winter construction equipment such as concrete heaters, thawing torches, oil-burning salamanders and water heaters.

If instead of writing direct to the manufacturer for these catalogs you prefer to send a list of the numbers you desire, to THE AMERICAN CITY, we will secure them for you.

Halve Water Consumption with Accurate Meters

TWENTY-TWO leading cities in this country that are 90 to 100 per cent metered have a per capita daily water consumption of 97 gallons. But seven other leading cities that are only about 20 per cent metered have to furnish 218 gallons per capita.*

The city that meters, cuts its water consumption in half and more. Water is money. Money was never more important in a generation.

Federal Water Meters are famous for their accuracy of measurement, even on minimum flows.

Where can there be found a better example of a self-liquidating investment for R.F.C. funds?

* Page 1363, Waterworks Engineering, Nov. 16, 1932.

The A. P. Smith Mfg. Co., East Orange, N. J.

SMITH

FEDERAL WATER METERS

LITTLE TALKS on Water Works Economy

No. 1

One water company reduced its pumping costs $4800 a year by having its mains cleaned by THE NATIONAL METHOD.

Another lowered its power bills for pumping $100 per month because of the cleaning of the mains by THE NATIONAL METHOD.

Still another put off to the far distant future the spending of $75,000 for new mains by having its old mains cleaned and restored to efficiency by THE NATIONAL METHOD.

Everywhere it's the same story: THE NATIONAL METHOD of water main cleaning *cuts water department costs.*

THE NATIONAL METHOD

NATIONAL WATER MAIN CLEANING CO.

FIFTY CHURCH ST., NEW YORK

THE STANDARD FOR 50 YEARS

Automatic Pressure Control Valves
Feed Water Filters — Portable Fire Hydrants
Hydraulic Engines — Hydraulic Booster Pumps

ROSS VALVE MFG. CO., INC.

ARCHIBALD STREET — TROY N. Y.

DONALDSON IRON CO.

Emaus, Lehigh Co., Pa.

Manufacturers of

CAST IRON PIPE

FOR WATER AND GAS

ALSO SPECIAL CASTINGS AND FLANGE WORK

FEBRUARY, 1933

Vol. XLVIII, No. 2

The American City

470 Fourth Avenue
New York

35 Cents, $2 a Year

Five Billions for Public Works and Housing?

AN interview with Rexford Guy Tugwell, Professor of Economics at Columbia University—a leading member of the so-called "brains trust" of the President-elect—which is given great prominence in the Scripps-Howard newspapers of January 26, gives reason for hope that the incoming administration may give backing to a program of public works and housing powerful enough to budge business off dead center.

Number 2 of Dr. Tugwell's seven-point program is of special interest to readers of THE AMERICAN CITY. It advocates "a widespread public works program, possibly entailing $5,000,000,000 at the start; direct relief to the indigent unemployed; intense stimulation to semi-public works projects, such as slum clearance, through the Reconstruction Finance Corporation."

On this important item in the program Dr. Tugwell is quoted as saying:

"What might have saved the situation earlier and what is necessary to be done now, if we are to make any impression on the forces at work, is in direct contrast with all that has been done.

"The energy and ingenuity which have been expended on our financial institutions ought to be turned toward the repairing of a nationally damaged purchasing power—not confidence, but actual power to buy.

"Even the objectives which it has been hoped to attain by the various financial measures which have been undertaken with so much romantic éclat really depend on such a restoration. For the values of property are dependent on the incomes derived from their productive uses. These incomes will continue to fall as long as our present paralysis continues.

"To attempt to support prosperity values for property among an idle and impoverished people is a futile gesture. To attempt to save the country by insuring the status quo of its banks is a good bit like attempting to revive a dying tree by applying fertilizer to its branches instead of to its roots. The country's financial institutions can only be salvaged by enabling its citizens to buy goods.

"If we lack purchasing power we lack everything. Possessing it, we have everything we value in prosperity values. It cannot be brought into being by magic, as many people seem to believe. But neither is its creation so mysterious as to be beyond possibility."

Highway and Building Congress Calls for Increased Street and Road Construction

AN overwhelming array of facts was presented at the great Highway and Building Congress in Detroit last month against the tendency which exists in some quarters to curtail or cease road work and to cripple highway transportation. Those in attendance pledged themselves to demand that all communities wherever possible use relief money for planned useful work rather than for doles.

A firm stand was taken for the continuance of Federal Aid:

"We deplore the proposal that Federal Aid to state highway improvement be curtailed or suspended at this time, and we urge Congress to continue the Federal Aid policy by appropriating during the present emergency a sum equal to that appropriated last year, and in any event not less than the revenues from Federal taxes on gasoline and tires."

A resolution was also adopted demanding that the revenues raised from motor-vehicle fuel taxes and license fees be used exclusively for highway construction and maintenance, and opposing the diversion of these fees and taxes to other purposes.

Construction League of the United States Urges a New Approach to Public Works

AT its meeting in Detroit in connection with the Highway and Building Congress, the Construction League of the United States adopted a resolution proposed by its General Chairman, Robert D. Kohn, of New York, in which the League went on record as favoring a comprehensive national plan of public works based on providing the best possible living and working conditions for the largest number of persons. The resolution follows:

"The Construction League of the United States, meeting in assembly at Detroit, January 21, 1933, expresses its grave concern at the effects of growing unemployment on private and public welfare. It finds that despite the appalling human and economic waste resulting from this condition, chief dependence is being placed on direct relief measures. In consequence there is a progressive loss of morale, which constitutes a threat to the future of our country.

"In view of the urgency of this situation the Construction League appeals to every department of government, business and industry to organize cooperation in planning to restore the unemployed to useful employment, in recognition of the fact that no progress toward recovery can be expected until men are put to work. Planned effort is essential because the surplus of workers will exist for a number of years.

"The League further points out that the industries which produce consumption goods cannot now or for some time to come absorb additional labor, while on the other hand there exists throughout the nation a clear need for new and improved public service facilities. It therefore urges that the surplus man-power be utilized as far as practicable in creating employment through public works, the rehabilitation of blighted areas, and the construction of decent housing for the low-income groups, all of these to be based on long-term planning so as to provide for the necessities and amenities of a better life both outside and inside our towns and cities."

Mountain Water for an Industrial City

This Well-planned Water System Adds River Water at Times of Heavy Demand

By THEODORE REED KENDALL
Engineering Editor, The American City

KINGSPORT, the leading industrial city of the eastern part of Tennessee, relies on a 200-mg reservoir, 700 feet above the city, for its major source of supply. This mountain source is known as Bays Mountain reservoir and is fed by springs. The water is soft, for it is chiefly rainwater which has not filtered through limestone deposits. The drainage area is between 1,600 and 1,700 acres, sufficient to furnish about 800,000 gallons daily through the 35,000-foot 10-inch Class D cast iron pipe from the reservoir to the filtration plant.

In order that this head may not be wasted, a De Laval hydraulic turbine, direct-connected to a 4-inch De Laval centrifugal pump of 350-gpm capacity, makes use of the water for power as it passes through the line to the aerator or to the mixing chambers. The pump delivers water from the clear well against a 265-foot head to the distribution system and to a 1-mg elevated tank at the far end of the town. The filtration plant is about 3 miles from the center of the city and is connected to it by a 20-inch cast iron line. The elevated tank is about 2 miles beyond the town and is connected with the gridiron system by a 16-inch cast iron line and serves to balance the pressure within the city.

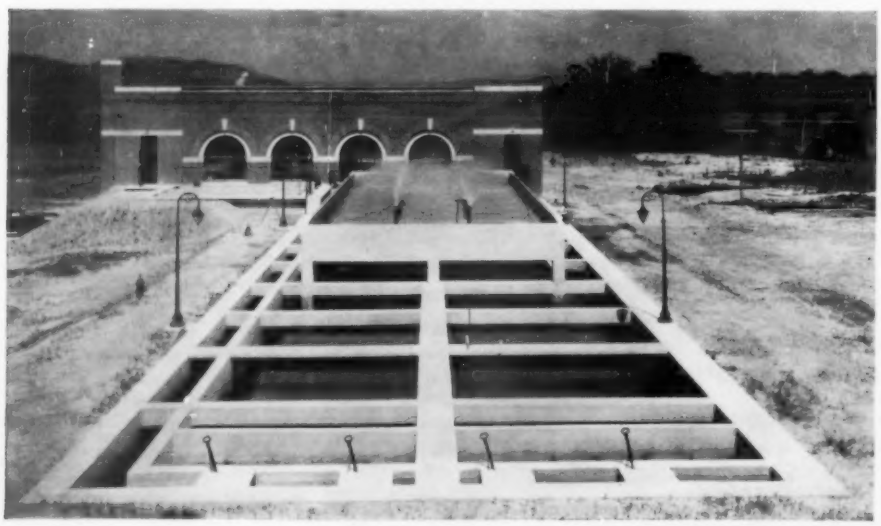
Aeration Basin

The 80 x 30-foot aeration basin, to which either the river or the mountain reservoir water is first delivered, is mounted on concrete columns above the settling tank. A set of 14 spray nozzles, consisting of bell-mouth pipes on 4-inch risers carried about 3 feet above the floor of the aerator, give adequate aeration to the water. The manifold is a 16-inch pipe to which the 4-inch risers are attached, and a spray is created by free-acting cones with 12-inch stems which are inserted in each bell mouth. When river water is being used at times of heavy draught, the amount of water going through the aerator is greatly increased, and hence the spray from each nozzle is greater in diameter.

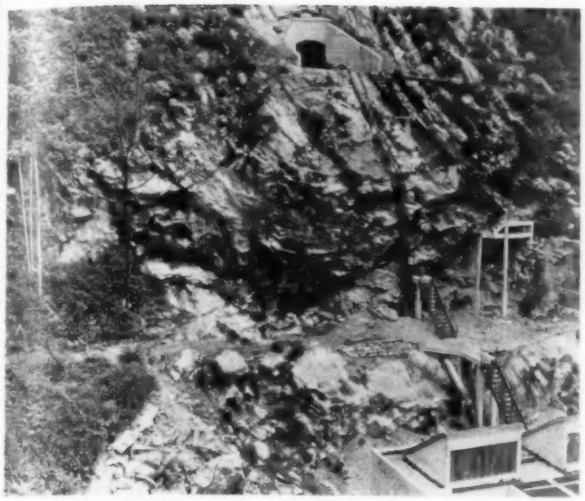
Concrete Mixing Chamber

A 16-inch cast iron line cast into the concrete floor at one corner of the aerator carries the aerated water to the concrete mixing chamber or flume, consisting of six 30-foot channels 30 inches wide and about 12 feet deep. About 15 feet from the influent end of the mixing chamber the chlorine solution is applied for prechlorination of the aerated water. The water then flows over and under a series of wood baffles, the number and exact position of which are changed according to the character of the water. Slots for these baffles are provided in the concrete walls of the mixing chamber at 3-foot intervals.

The alum solution is applied near the end of the first 30-foot section of channel. From the mixing chamber the water with its well-developed floc flows through a flume 4 feet deep, 30 inches wide and about 150 feet long, running the full length of one side of the settling basin and then across the end. The water is admitted to the settling basin through four 10-inch sluice-gates and is then given a downward flow by 12 x 24-inch sheet-iron boxes which extend 6 feet below the surface. The water in the settling basin is normally 12 feet deep with 18 inches of freeboard. The settling basin is 30 feet wide and is built with an 8-inch concrete baffle wall located about 6 feet from the sluice-gate, with 8-inch square holes placed with one



A GENERAL VIEW OF THE WATER PURIFICATION PLANT AT KINGSPORT, TENN., SHOWING THE SETTLING BASINS IN THE FOREGROUND, THE AERATORS, AND THE FILTER BUILDING AND PUMP HOUSE



THE RIVER PUMP STATION AND ADIT OF THE TUNNEL

of the diagonals vertical and spaced 30 inches on centers both horizontally and vertically. The settling basin is equipped with three 12-inch plug valves, each located in the bottom of a four-way hopper for collecting and drawing off the accumulated settled floc. Both longitudinal and transverse walkways are provided on concrete columns in the settling basin.

The piping system and valves are so arranged that it is possible to by-pass the aerator and carry the water direct to the mixing chamber in case adjustment in the aerator must be made or it is not deemed necessary to aerate the water at any time. A 2-inch lime solution line is carried from the chemical room to a point about one-quarter of the length of the basin from the effluent end of the settling basin and at one side of the basin. An interesting accessory of the settling basin is the 2-foot wire frog fence to keep these lively animals from reaching the settling basin. The basin is already equipped with a 2-inch line through which Nuchar activated carbon has been applied near the effluent end of the basin to eliminate tastes not removed by aeration. The plant is also equipped with an ammoniator which delivers the ammonia solution to the water before it reaches the aerator.

A wall 8 inches thick and about 6 feet from the effluent end of the settling basin acts as a weir, the top of the wall being about 3 feet below the surface of the water. Two bell mouths at the top of 16-inch pipes are located in the effluent end of the settling basin about 3 feet above the bottom, to carry the water to the filters. There are also two sluice-gates in this section of the settling basin, so that it is possible to drain off the water between the weir and the outer wall of the basin and below the level of the effluent pipe.

The Filter Plant

Two 1-mgd International filters with 720 square feet of combined filter area constitute the filtration equipment for the Kingsport water works. The concrete wash-water troughs are built with the tops of the troughs 24 inches above the sand, and the underdrain and wash-water pipe consist of a 16-inch manifold with 3-inch laterals. The effluent pipe is a 10-inch cast iron pipe. The filter bed consists of 18 inches of gravel from 2½-inch material down to pea gravel, with an overlying bed of 30 inches of sand. No air wash is used in the plant. The filters are equipped with International control tables and Builders Iron Foundry rate-of-flow and loss-of-head gages and a recording gage.

Some difficulties are experienced at various times of the year with disturbing elements which materially reduce the length of the filter run. It is noted that longer runs are usually secured with river water than with the mountain water. The algae which abound in the mountain reservoir cause a material reduction in the length of the run, but are usually kept well in hand by periodic treatments of the reservoir with copper sulphate spread with the use of an outboard motorboat.

Varied Consumption

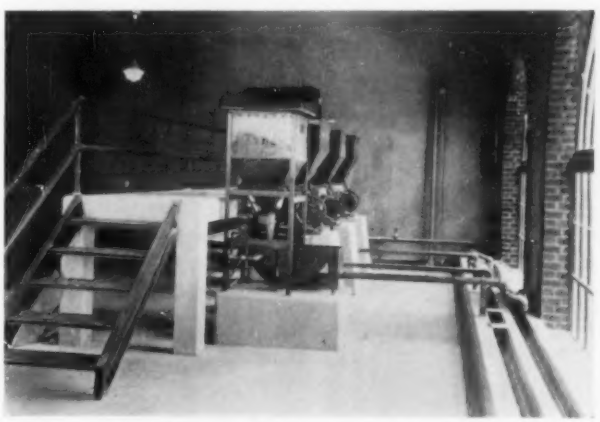
When the plant was first opened, the daily consumption in the city was about 1,000,000 gallons, but that has been reduced to about 700,000 gallons daily by a systematic survey which has eliminated a number of leaks. The city is 100 per cent metered.

The mountain reservoir is able to furnish about 800,000 gallons per day, or enough to operate one filter. River water is used from two to three hours a day in summer to supplement the mountain source, but in winter it is possible to shut down the plant completely for several hours each day and permit the 1,000,000-gallon elevated tank at the far end of town to care for the demands during the night.

A clear-water well of 350,000 gallons capacity and with a depth of 12 feet is located under the entire filter and pump building, with the filters on a mezzanine at one end of the building, the pumps on the ground floor immediately over the clear well, a laboratory and an office on the mezzanine, the chemical storage on the ground floor at the opposite end from the filter, and the chemical solution room with its dry feed machine immediately above.

Chemical Dry Feed Machines

There are four dry feed chemical machines, one Leopold machine for lime or alum but generally used for applying lime, two International machines for applying alum, and one International machine for feeding lime. The four dry feed machines are set up in a row at floor level, with a runway or extended platform behind them, from which the bags of chemicals are emptied into the hopper at the



THE BATTERY OF DRY FEED CHEMICAL MACHINES

Mountain Water for an Industrial City

This Well-planned Water System Adds River Water at Times of Heavy Demand

By THEODORE REED KENDALL
Engineering Editor, The American City

KINGSPORT, the leading industrial city of the eastern part of Tennessee, relies on a 200-mg reservoir, 700 feet above the city, for its major source of supply. This mountain source is known as Bays Mountain reservoir and is fed by springs. The water is soft, for it is chiefly rainwater which has not filtered through limestone deposits. The drainage area is between 1,600 and 1,700 acres, sufficient to furnish about 800,000 gallons daily through the 35,000-foot 10-inch Class D cast iron pipe from the reservoir to the filtration plant.

In order that this head may not be wasted, a De Laval hydraulic turbine, direct-connected to a 4-inch De Laval centrifugal pump of 350-gpm capacity, makes use of the water for power as it passes through the line to the aerator or to the mixing chambers. The pump delivers water from the clear well against a 265-foot head to the distribution system and to a 1-mg elevated tank at the far end of the town. The filtration plant is about 3 miles from the center of the city and is connected to it by a 20-inch cast iron line. The elevated tank is about 2 miles beyond the town and is connected with the gridiron system by a 16-inch cast iron line and serves to balance the pressure within the city.

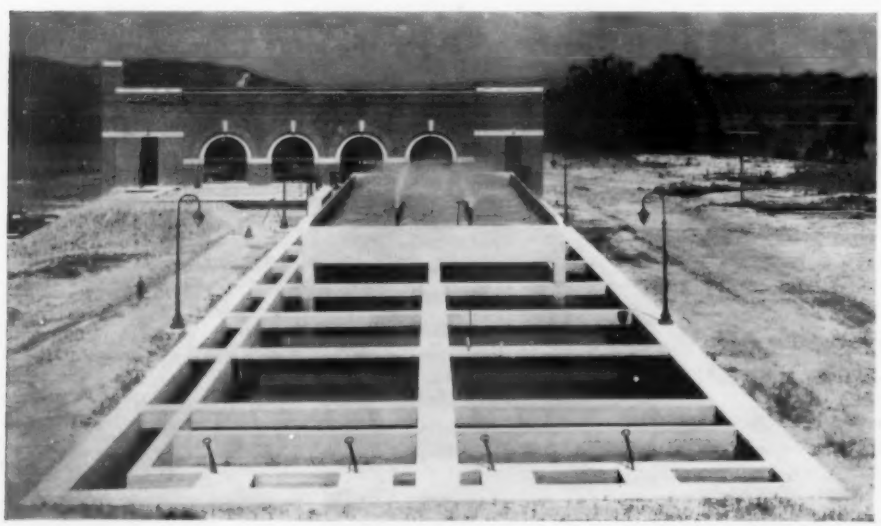
Aeration Basin

The 80 x 30-foot aeration basin, to which either the river or the mountain reservoir water is first delivered, is mounted on concrete columns above the settling tank. A set of 14 spray nozzles, consisting of bell-mouth pipes on 4-inch risers carried about 3 feet above the floor of the aerator, give adequate aeration to the water. The manifold is a 16-inch pipe to which the 4-inch risers are attached, and a spray is created by free-acting cones with 12-inch stems which are inserted in each bell mouth. When river water is being used at times of heavy draught, the amount of water going through the aerator is greatly increased, and hence the spray from each nozzle is greater in diameter.

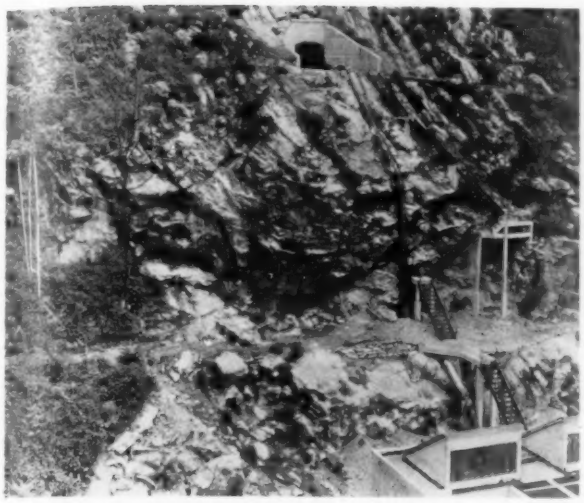
Concrete Mixing Chamber

A 16-inch cast iron line cast into the concrete floor at one corner of the aerator carries the aerated water to the concrete mixing chamber or flume, consisting of six 30-foot channels 30 inches wide and about 12 feet deep. About 15 feet from the influent end of the mixing chamber the chlorine solution is applied for prechlorination of the aerated water. The water then flows over and under a series of wood baffles, the number and exact position of which are changed according to the character of the water. Slots for these baffles are provided in the concrete walls of the mixing chamber at 3-foot intervals.

The alum solution is applied near the end of the first 30-foot section of channel. From the mixing chamber the water with its well-developed floc flows through a flume 4 feet deep, 30 inches wide and about 150 feet long, running the full length of one side of the settling basin and then across the end. The water is admitted to the settling basin through four 10-inch sluice-gates and is then given a downward flow by 12 x 24-inch sheet-iron boxes which extend 6 feet below the surface. The water in the settling basin is normally 12 feet deep with 18 inches of freeboard. The settling basin is 30 feet wide and is built with an 8-inch concrete baffle wall located about 6 feet from the sluice-gate, with 8-inch square holes placed with one



A GENERAL VIEW OF THE WATER PURIFICATION PLANT AT KINGSPORT, TENN., SHOWING THE SETTLING BASINS IN THE FOREGROUND, THE AERATORS, AND THE FILTER BUILDING AND PUMP HOUSE



THE RIVER PUMP STATION AND ADIT OF THE TUNNEL

of the diagonals vertical and spaced 30 inches on centers both horizontally and vertically. The settling basin is equipped with three 12-inch plug valves, each located in the bottom of a four-way hopper for collecting and drawing off the accumulated settled floc. Both longitudinal and transverse walkways are provided on concrete columns in the settling basin.

The piping system and valves are so arranged that it is possible to by-pass the aerator and carry the water direct to the mixing chamber in case adjustment in the aerator must be made or it is not deemed necessary to aerate the water at any time. A 2-inch lime solution line is carried from the chemical room to a point about one-quarter of the length of the basin from the effluent end of the settling basin and at one side of the basin. An interesting accessory of the settling basin is the 2-foot wire frog fence to keep these lively animals from reaching the settling basin. The basin is already equipped with a 2-inch line through which Nuchar activated carbon has been applied near the effluent end of the basin to eliminate tastes not removed by aeration. The plant is also equipped with an ammoniator which delivers the ammonia solution to the water before it reaches the aerator.

A wall 8 inches thick and about 6 feet from the effluent end of the settling basin acts as a weir, the top of the wall being about 3 feet below the surface of the water. Two bell mouths at the top of 16-inch pipes are located in the effluent end of the settling basin about 3 feet above the bottom, to carry the water to the filters. There are also two sluice-gates in this section of the settling basin, so that it is possible to drain off the water between the weir and the outer wall of the basin and below the level of the effluent pipe.

The Filter Plant

Two 1-mgd International filters with 720 square feet of combined filter area constitute the filtration equipment for the Kingsport water works. The concrete wash-water troughs are built with the tops of the troughs 24 inches above the sand, and the underdrain and wash-water pipe consist of a 16-inch manifold with 3-inch laterals. The effluent pipe is a 10-inch cast iron pipe. The filter bed consists of 18 inches of gravel from 2½-inch material down to pea gravel, with an overlying bed of 30 inches of sand. No air wash is used in the plant. The filters are equipped with International control tables and Builders Iron Foundry rate-of-flow and loss-of-head gages and a recording gage.

Some difficulties are experienced at various times of the year with disturbing elements which materially reduce the length of the filter run. It is noted that longer runs are usually secured with river water than with the mountain water. The algae which abound in the mountain reservoir cause a material reduction in the length of the run, but are usually kept well in hand by periodic treatments of the reservoir with copper sulphate spread with the use of an outboard motorboat.

Varied Consumption

When the plant was first opened, the daily consumption in the city was about 1,000,000 gallons, but that has been reduced to about 700,000 gallons daily by a systematic survey which has eliminated a number of leaks. The city is 100 per cent metered.

The mountain reservoir is able to furnish about 800,000 gallons per day, or enough to operate one filter. River water is used from two to three hours a day in summer to supplement the mountain source, but in winter it is possible to shut down the plant completely for several hours each day and permit the 1,000,000-gallon elevated tank at the far end of town to care for the demands during the night.

A clear-water well of 350,000 gallons capacity and with a depth of 12 feet is located under the entire filter and pump building, with the filters on a mezzanine at one end of the building, the pumps on the ground floor immediately over the clear well, a laboratory and an office on the mezzanine, the chemical storage on the ground floor at the opposite end from the filter, and the chemical solution room with its dry feed machine immediately above.

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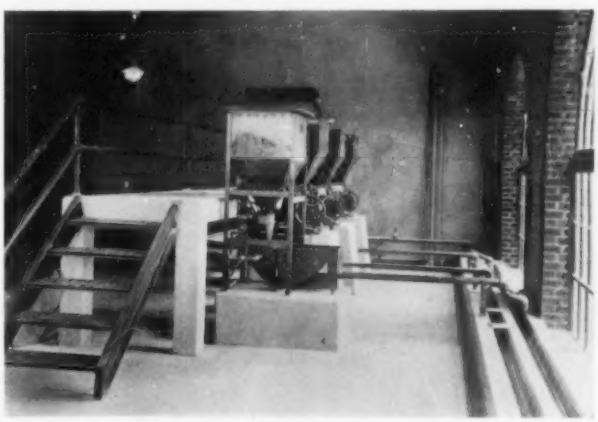


THE BATTERY OF DRY FEED CHEMICAL MACHINES

THE AERATORS, WITH THE MIXING CHANNEL IN THE FOREGROUND

top of the machine. Two two-way concrete troughs measuring about 6 inches wide and 8 inches deep, and with reversible flows, are located against the wall in front of the dry feed machines, with 2-inch pipes running from the machines to the troughs. At each end of the two concrete troughs are pipes leading to various parts of the plant, so that either lime or alum may be applied to the water at different points.

The electric switches for the operation of the four dry feed machines are located on a wall at one end of the platform behind the machines. One of the Leopold machines was used for applying activated carbon during the experiments with this new material.

On the chemical room floor is a Builders Iron Foundry gage for showing the level of water in the settling basin, and this gage operates a hydraulic valve on the river water line. The river pump, controlled from the plant, is operated at constant speed, and the amount of water delivered to the aerator or mixing chamber is controlled by the hydraulic valve. Two Wallace & Tiernan chlorinators are installed in the plant, one for prechlorinating the water, and the other for applying a chlorine solution in the clear well. In conjunction with the effluent chlorinator a Fairbanks springless scale is used, so that a glance at the large dial immediately shows the weight of the chlorine cylinder and also that of the remaining chlorine contained therein.

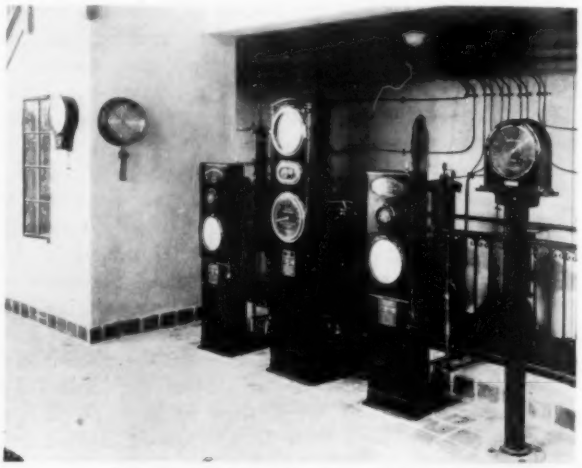
THE FILTERS, WITH ONE DRAINED TO SHOW THE WASH-WATER TROUGHS

Pump Equipment

The filter pipe gallery opens directly onto the pump-room floor, so that the pipe gallery is always well ventilated and all pipes and valves are readily accessible.

A De Laval 3.50-mgd wash-water pump mounted on the pump-room floor takes water from the clear well and delivers it to a 75,000-gallon steel tank on the hill behind the plant. This gives a 55-foot head available for washing the filters.

There are three Builders Iron Foundry venturi meters in the filtration plant, one on the mountain water, one on the wash-water line, and one on the pump discharge to the city. The difference in readings between the mountain-water meter and the pump discharge to the city is the quantity of river water used. An indicator in the pumping station shows the depth of water in the wash-water tank. The wash-water pump is never run when filters are being washed.



GAGES AND METERS TELL THE STORY

Left to right: on wall, pressure gage and wash-water gage; on the floor, wash-water meter, reservoir raw-water meter, 20-inch venturi meter to distribution system and the clear well indicator

There are four distribution pumps, including the water turbine operated by the mountain water as it reaches the filter plant. There is a Goulds 700-gpm 2-stage centrifugal operating against a 265-foot head and driven by a 60-horsepower General Electric motor. The second is a De Laval 2-stage, 1,400-gpm pump operating against 265-foot head and driven by a 125-horsepower GE motor. The third is a De Laval 2-stage slow-speed pump delivering 2,000 gpm against a 265-foot head and driven by a 200-horsepower GE motor. It is interesting to note that there is no gasoline or diesel engine standby pump in this station. The reason for this is that the hydraulic turbine serves as the stand-by power unit.

An electric priming pump on the pump floor at the plant primes all the distribution pumps. On the pump floor also is located a Gurley stage recorder to show the height of water in the elevated tank. An examination of the weekly charts of this recorder shows a distinct drop in the elevation of the water in the tank on Mondays, indicating the almost universal American habit of a Monday washday.

Analyses and Chemicals

The raw water, both river and mountain, has an alkalinity of about 12, while the filtered water to which some lime has been added has an alkalinity of about 20. The raw water has about 3 ppm of carbon dioxide, and the filtered water 1 part per 1,000,000. The raw water shows ten to twenty colonies of bacteria on nutrient agar, and the filtered water one. There is an occasional presumptive B coli in 10 cc of the raw water.

When mountain water alone is used, about one grain per gallon of alum is used and about one-half grain per gallon of lime. The river water requires from 2 to 3 grains per gallon of alum and the same amount of lime as does the mountain water.

The River Intake

There are three De Laval centrifugal pumps at the river intake, a 700-gpm, a 1,000-gpm and a 1,400-gpm, all working against 135-foot heads. Water is delivered from the river intake by these pumps through 1,400 feet of 16-inch cast iron pipe which runs through a 400-foot rock tunnel to the plant. Either the two small pumps or the large river pump, but not all three, are used to keep down the connected horsepower load. The pumps are controlled entirely from the filtration plant. The power line is an armored cable laid below ground for the entire distance from the filtration plant to the river intake.

The Kingsport water works were designed and the construction superintended by Wiedeman & Singleton, consulting engineers, Atlanta, Ga. Burford, Hall & Smith of Atlanta, Ga., furnished the switchboard and pumps as well as the armored cable to the river. V. B. Higgins built the filter building, J. B. McCrary the pumping station on the river, and the Alley Construction Co. the storage tank. The plant is operated by M. L. West, chief operator, under the direction of W. L. Webster, City Engineer and Superintendent of Water Works.

Beach Sand Builds Bituminous Road

Unorthodox Mixture Used Successfully for Resurfacing in Humboldt County, California

By **F. W. HASELWOOD**
District Engineer,
State Department of Public Works,
Division of Highways,
Redding, Calif.

THE quality of highway surfaces has been markedly improved in recent years by refinement in the specifications for materials and the methods of combining them and placing them on the road. The proper selection, combination and placing of materials constitute a case of judicious and skillful application of the principles developed by experience, and uniformly result in a durable and satisfactory road. Suppose, however, that one or more adverse circumstances inject themselves into the picture. Circumstances certainly alter cases. For instance, suppose that within practical limits of transportation from a road on which surface renewals are imperative there exists no mineral aggregate that complies with the requirements of the standard specifications or that is approved by the testing laboratory. Such a circumstance must alter the case or there will be no resurfacing.

Hands Off Park Rock

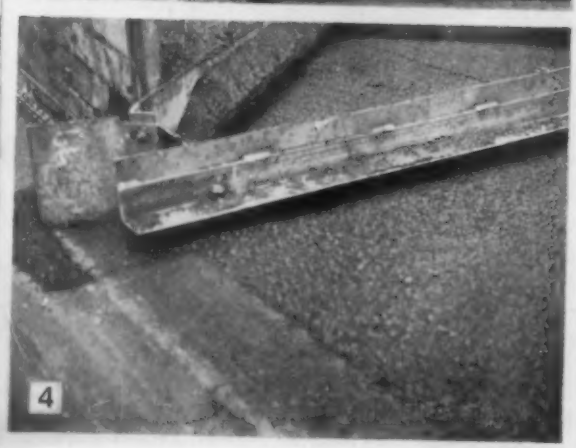
On a recent project in Humboldt County near Big Lagoon where resurfacing was absolutely necessary, the only rock of satisfactory quality within hauling range was in a state park and could not be used. Laboratory tests were made of every other source of rock, with the hope of devising some means of using a soft aggregate with some grade of asphalt. There existed a good deposit of conglomerate which was made up of soft rock that broke up readily in handling, disintegrated quickly when placed on the road and contained a large proportion of clay.

A SECTION OF THE FINISHED HIGHWAY NEAR BIG LAGOON, CALIF.

Plenty of Beach Sand

The other available aggregates were beach sand from ¼-inch down and a finer yellow sand available in cuts along the road. Except for the soundness of the beach sand, these aggregates did not meet any of the requirements of the specifications for aggregate for road base or surface, whether treated with asphalt or not.

A limited fund was available for resurfacing and had to be stretched over a length of 8.4 miles. Both base and surface renewals were necessary. Base reinforcement was made with the conglomerate and the beach sand. The work was done by day labor. The conglomerate developed too much clay fines by the time it was spread, but the addition



of beach sand ranging up to ¼-inch so changed the characteristics of the aggregate that a compact and well-bound base was developed by thorough processing, watering and rolling.

The amount of clay in the conglomerate varied from none to nearly 100 per cent; therefore, the amount of sand applied varied accordingly and was determined by the foreman in charge. If he had too little sand, his roller would be likely to get stuck in the mud. If he had too much, the base would not bind. With one minor exception the empirical field combination of the two materials was so perfect as not to require retreatment.

Heat Helped

The base gave every promise of stability if protected against wear and weather, but what of the top? The only aggregates available that were sound enough to be used with asphalt were the beach sand and the yellow roadside sand. The beach sand is round and polished. The laboratory had difficulty in getting cut-back asphalt of any grade to adhere to the smooth surfaces. No combination of the two sands would result in a grading even approximating that required by the specifications.

Field tests were made to ascertain the behavior of different combinations of the two sands and asphalt under traffic. First, cut-back 94+ road oil was used. The mixture was spread over the full width of the road to a depth of 2 inches and for a distance of about 30 feet. It did not roll or displace under traffic, but on the other hand it did not harden and the asphalt did not adhere well to the beach sand.

The trouble appeared to be in the presence of the coal oil with which the asphalt was cut back, so the coal oil was omitted and both the sand and the road oil were heated. Believe it or not, the asphalt stuck to the heated sand as if it belonged there. This mixture hardened at night, and was fairly firm on a cloudy day, but on a sunny day it was nearly as soft as when first placed.

These combinations with road oil were obviously unsatisfactory, but two months later, when removed for the resurfacing, they had not corrugated or displaced under traffic although they were still soft on sunny days.

Other Combinations Tried

In an endeavor to obtain the best grading possible from the materials, the beach sand was split into two sizes, ¼- to ⅛-inch and ⅛-inch to 0, and combined in various proportions with the yellow roadside sand. The latter contained some fines passing a 200-mesh screen but the larger portions passed a 20- and was retained on a 40-mesh sieve. But little of the beach sand passed a 40-mesh sieve.

Various combinations of these three grades of sand were tried in the field experiments. Strangely enough, every combination seemed to indicate by the surface area method that about 3.3 per cent of asphalt was required. The field tests indicated that the most stable mixture was obtained by the use of 50 per cent of the aggregate from ¼- to ⅛-inch and about 25 per cent each of the two grades of sand.

PREPARING AND SPREADING THE SAND-ASPHALT TOP

1. Loading the beach sand into trucks with a Bucyrus-Erie dragline. 2. The asphalt plant where the mix was prepared. 3. Spreading the sand-asphalt from a hauling truck. 4. A close-up of the spreader

Increase in the amount of sand resulted in a mushy mixture, and a decrease, in a porous mixture.

The Final Combination

The average grading and asphaltic content of this combination compared with the specified grading for Type C asphaltic concrete is as follows:

Sieve Sizes	*Per Cent Passing*	
200	2.3	10%— 20%
100	4.5	
80	7.3	35%— 55%
40	19.4	60%— 70%
20	31.6	
10	44.3	70%— 90%
3	95.2	90%—100%
½	99.3	100%
	3.5	9%— 15%

Obviously, with round aggregate having such polished surfaces stability must be furnished by the asphalt, for there is no mechanical locking of the aggregate. Since use of aggregate from the beach required that the material be dried, the same plant was necessary as for asphaltic concrete. It was therefore just as economical to use D grade asphalt, and as this promised the greatest stability, it was specified.

A condition contributing to the success of this type of construction is prevailing low temperatures in the area where it is used. Atmospheric temperatures above 70 degrees are rare and in July and August there is either high or low fog with little sunshine. Allowing for 50 per cent increase of atmospheric temperatures where the road is in sunshine for a major portion of the day, the pavement temperature would rarely, if ever, exceed 110 degrees.

Resurfacing in Two 2-Inch Layers

The average thickness of the asphalt-treated surface is 4 inches. It was put down in two layers, each thoroughly rolled. Experience indicated that unsatisfactory compaction was not obtained if the layers were much in excess of 2 inches in thickness. The mineral aggregate was heated to about 350 degrees in the dryer, and the mixture was spread on the road at a temperature of about 280 degrees. The hot material was spread and leveled by the use of a combined spreader box, strike-off and leveling blades, developed in the district office and used by contractors on other asphaltic jobs. No headers were used and no trouble was experienced in maintaining the edges of the surface.

A few rakers were necessary, but blading was impracticable. The roller was able to work close to the spreader, whereas with cut-back mixes the roller had to be kept from three to five hours behind the spreading. The surface was made non-skid by application of the coarser aggregate, coated with asphalt as is customary.

The length of the job was 8.4 miles, and the asphalt-treated surface was 20 feet x 4 inches. Including the construction of shoulders, 2 feet x 4 inches of selected materials but exclusive of base reinforcement, the improvement cost $8,252 per mile, and up to the present time has provided a satisfactory, safe and durable surface at low cost.

RAKING AND ROLLING THE HOT MIX TOP

1. Rakers followed the spreader closely and kept the spread mix uniform in texture. 2. A stretch of recently spread material. 3. Rolling the edge of new material. 4. A close-up of the finished surface

Eight Years' Experience with Water Mains

Installation and Maintenance Methods in Dallas, Texas

By **W. H. WARING**

Distribution Engineer,
Water Department,
Dallas, Texas

THE water distribution system in Dallas, Texas, comprises some 450 miles of pipe ranging from 1½-inch galvanized up to 36-inch cast iron, a quantity of all sizes between and including these limits having been laid in the last eight years.

Beware of Sloppy Pipe Laying

Too little care is usually employed in the installation of water mains. Since most water systems operate under a more or less high head, it is not necessary to follow established flow grades as in the case of sewers and other forms of pipe line work. The fact that a water main can be laid over, under or around almost any obstruction seems to have affected the whole method of handling the job of pipe laying, and to have caused the general feeling that all that is necessary to lay a water main is to dig a ditch, roll the pipe in, make the joints, backfill and leave it.

Cast iron pipe, as a rule, is made and shipped carefully by the manufacturer. It should be unloaded, where possible, with a derrick or crane, or where such equipment is not available, with long skids and heavy ropes. The same care should be exercised in loading and unloading pipe from trucks used for transporting it to the job. Pipe should be unloaded from the truck on skids, except in the case of smaller, light-weight sizes, which can often be pulled from the back of the truck and lowered to the ground by two or three men. The pipe should be strung along the ditch with the bells facing the laying direction, and as near as possible to the place where it will be used. Some attention should be paid to the extra length or gain in each joint, which is common in pipe of this day, over the usual 12,- 16- or 18-foot lengths usually called for. In long lines of pipe this gain sometimes amounts to quite an item.

Trenches

Excavation for pipe lines will vary according to the climate as to depth, and according to the type of soil as to the width of the trench. Dallas requires a minimum of 3 feet of cover on pipe of all sizes excepting temporary lines of small diameters. Additional depth should be required where pipe lines cross under railroads or other transportation lines, or even extremely heavy traveled streets and roadways.

Trenches should be wide enough to be properly backfilled. As a rule, sandy or semi-sandy soils are more easily backfilled than heavy clay, and the trench may be relatively narrower. Average widths of trenches range from 20 inches for 4-inch pipe to approximately 60 inches for 36-inch pipe. Trenches in rock should be excavated from 4 to 6 inches below the grade which would be used in all earth excavation, in order that the pipe may be bedded down on an earth or sand cushion. Cast iron pipe should never be laid on rock, even though it may be necessary to haul the proper material for cushioning from some distance.

Extra excavation is necessary at the bell of the pipe to facilitate the preparation of the joint. More or less hard-and-fast dimensions have been given by authorities for the size of these bell-holes, but the best guide is the kind of jointing material used and the capability of the calkers. In any case, the bell hole should be large enough for the calkers to reach all points on the joint with as little interference as possible. Naturally, a smaller bell hole is required where self-calking jointing materials are used than with the poured lead joint.

Pipe Laying

Cast iron pipe should always be lowered into the ditch by ropes or skids or some other mechanical means. Each length should be tested by hammer tapping for possible cracks or fractures before being finally lowered into the ditch. No pipe should ever be installed in the line when there is any question whatsoever of its being entirely sound.

Fittings should be placed at every location where it is probable there will be a future connection, and stub-outs installed if the street along which the line is laid is to be paved. It is more economical to break out a plug than to sleeve-in a tee or cross, and pipe, as a rule, is much cheaper than paving repairs. Where the city or the water company is large enough to warrant owning a valve-tapping machine, a great many of these openings for future connections may be dispensed with in unpaved streets, but these machines are usually found only in the metropolitan centers.

Gate-Valves

Gate-valves are a highly important part of any distribution system, and there cannot be too many of them. No one likes breaks in water mains, but they do happen, and I have seen instances where one 6-inch valve, installed when the line was laid, would have prevented the shut-down of from six to twelve additional valves and saved untold quantities of wasted water.

At least three gates should be placed at each intersection of mains which constitute a part of a distribution gridiron. In long runs of pipe between intersections in Dallas the Department places a valve every 500 feet on mains within the limits of the distribution system. On the large supply mains valves are placed on every branch at each intersection and not over 2,500 feet apart in any case.

Air-Release Valves and Blow-Offs

Air-release valves are another very important unit in a good water-main installation, especially if the line or lines are installed in a locality where there are extremes in grade. Trapped air is a source of great trouble in a water main, and even though it does not actually fracture the main, it will give constant trouble with the joints of the line. Air-release valves should be installed at all high points in the line or system where there is any possibility of air collecting.

Blow-off branches should be installed at low points in order that pipes may be drained as speedily as possible in case of a shut-down. There are two good reasons for this, one being that it is expensive to pump waste water. The other reason is that the prime object of the water system is to serve the public, and the shorter the period of interrupted service, the better.

Fire Hydrants

Fire hydrants are a part of the water-main system and entirely dependent on it. Texas law requires a 5-inch valve opening hydrant on a 6-inch lead within 500 feet of real property to give that property the benefit of the lowest insurance rates. In Dallas hydrants are set approximately every 800 feet in residential districts, and in congested value districts just as close together as the development seems to require and the system will supply with effectiveness.

Pipe Joints

In making joints on pipe lines, constant care should be exercised and only first-class materials used, for the joint is the source of more petty trouble than any other part of the line. For lead joints Dallas uses only No. 1 grade, dry, long fiber, hard-twisted jute and lead which will meet the A. S. T. M. specification for soft Missouri lead. This specification calls for 99.931 per cent lead.

For self-calking jointing materials such as Leadite and Hydrotite, No. 1 grade, dry braided jute of the size best suited to the particular size of pipe on which it is to be used is required. Enough jute should be used to fill the joint to within 2 to 2½ inches of the face of the bell. Each strand should be lapped about 1 inch, and the laps of successive strands should be staggered. The first strand should be placed around the spigot before it is socketed, to serve as a spacer. The spigot should be well back against the bell, except in extremely cold weather, and spaced evenly all around. Each strand of jute should be driven separately until the whole is well compacted in the joint.

Care should be taken to see that the joint runner fits firmly to the bell all around and that all spaces around the pouring gate are closed with clay or mud. In making joints, either lead or compound, the whole joint should be poured at one operation where at all possible. Metal pouring cones or gates should always be used with the self-calking compounds, and a much better joint will be obtained if two of these cones placed about three inches apart are used on pipe above 16-inch in size. After the material has cooled and the runner has been removed, the plug left at the pouring gate should be cut off and the lead joint calked. Calking of a lead joint should start with the scoring or common cold chisel, working completely around the joint at the junction of the lead and the pipe, repeating the operation, using a larger tool each time, until the width of the joint is reached. Calking with pneumatic hammers is better on large sizes of pipe. The compound joints are of course complete with the removal of the runner and plug. These joints will sweat a little at first, but will soon become watertight.

Backfill

For best results, the backfill should be tamped, either by hand or with pneumatic tampers, at least to the spring line. In sand or semi-sandy soils this is not so essential, but in clay and rock it is quite necessary. For sandy soils and the upper fill of rock and hard earth excavation, flushing is usually sufficient. The Dallas Water Department uses a flushing nozzle made by tapping a 2½-inch fire hydrant nozzle cap and attaching to it a length of 1-inch pipe. By attaching this nozzle to several sections of fire hose, it is possible to cover the whole line quite effectively, and by using the nozzle to introduce the water at the bottom of the ditch it takes less water and less time to finish the job. All ditches are left mounded from 6 to 8 inches to allow for final settlement.

Repair and Maintenance

The repair or maintenance of water mains may well be divided into two general classes; namely, routine maintenance and emergency maintenance. It should always be remembered that the more care that is used in the original installation, the lower maintenance costs will be. Under rountine or regular maintenance are included the inspection of valves, fire hydrants, exposed mains, etc. All valves should be operated twice yearly and repaired as needed. Operating them at least twice a year gives corrosion and incrustation no time to set to any marked extent and saves many bent and broken stems and other more expensive repair work.

In some cities fire hydrants may be maintained entirely by the fire department and therefore no need may arise for the water department to inspect them. In Dallas, the Water Department buys, installs and maintains the hydrants. The Fire Department, however, makes a twice-a-year inspection of all hydrants, reporting all defects to the Water Department. In addition to this, the regular fire-hydrant maintenance truck, when not engaged on actual repairs, cruises over the city on inspection trips. All exposed mains, crossing creeks, drainage ditches, etc., are recorded and inspected regularly in order that they may be kept painted, piers kept clear of brush, etc. Under emergency maintenance are included all leaks, including joint leaks, split pipe, fractured pipe, etc., as well as moving, lowering and raising mains.

Leaky joints may be traced to any number of causes, such as poor workmanship, settlement, vibration, water hammer, etc. Lead joints may be repaired by simply recalking if the leak is slight and the lead is not too hard. The joint should be recalked, however, around the complete circumference of the pipe, and not just at the point at which it is leaking. If the leak is bad and the joint partly blown out, or if the lead has lost its compressibility, it is best to remove all old materials and re-run the joint completely.

Compound joints, if leaking only slightly, may often be repaired by several sharp blows on the outside of the bell,

or by very light calking on the joint itself. We have had a measure of success in repairing more or less bad leaks on these joints by cutting out a section and calking in cold lead, either lead wool or lead slugs. We use this method, however, only where the joint is very sound except at the point of the leak. If the whole joint is bad, then it is cut out and re-run completely with lead or compound.

Split pipe may often be repaired by using a split sleeve, where the crack is only a few inches long, or by clamps where it is of considerable length. In Dallas clamps are preferred to split sleeves. In using clamps a strip of thin lead is placed over the crack, under the clamps, and is calked with a small iron for the length of the crack. Success has attended the use of these clamps on mains as large as 36-inch. In one notable instance, some seven years ago, a 36-inch main located directly under a seven-room brick residence was clamped successfully.

For open fractures or bad cracks, there is no alternative but to cut out the defective section and sleeve-in a new piece. For this work long pattern, solid sleeves are used in Dallas. In cases of bad breaks, a thorough investigation is made to determine, if possible, the cause of the trouble so that a recurrence may be prevented.

Records Are Most Important

Too much stress cannot be laid on the matter of proper and adequate records, of both new installations and maintenance work. Two map systems show all new construction in Dallas. One is a large map of small scale showing the whole system. The other is a large-scale, sectional or block map showing the location of all mains, hydrants and valves in detail. Measurements are taken from established property lines or curb lines of permanently paved streets.

A permanent record is made of every maintenance job of any kind and is carried in alphabetical street files according to the classification of the work performed. The files are kept active for one year back at all times. These records are quite useful in protecting the city from false claims for damages due to leaks, etc.

ACKNOWLEDGMENT.—From a paper presented before the Texas Section, Southwest Water Works Association.

Well-Balanced Waste Collection and Disposal

Roanoke, Va., Successfully Combines Incineration with Sanitary Dump

WHILE most of the population of Roanoke, Va., were pleased with the warm winter of 1931-32, it placed an extra burden on the Sanitary Department because it was necessary to continue the summer collection schedule for household waste. Cold weather retards the putrefaction of organic matter, so that all cities in the North and many of the cities in the South usually reduce the number of weekly collections in winter.

Collection Equipment

The collection equipment in Roanoke consists of twelve trucks—one 2-ton Garford, four 1-ton Model T Fords, four 1½-ton Model A Fords, one 1½-ton Chevrolet, and two 1-ton Dodges. Two of the trucks are used in the business section for daily collection, and two haul tin cans and ashes. The other eight have definite residential routes which they follow week-in and week-out.

The collection trucks start out at seven in the morning and make from five to seven trips to the incinerator during the day. The routes are so laid out that the men are able to cover them twice a week. Where apartment houses predominate, the routes are shorter, and where single residences are scattered, the routes are materially lengthened. In addition to the twelve trucks mentioned, there are three one-horse wagons used for collecting garbage in the resi-

DODGE COLLECTION TRUCK AND COVERED GARBAGE CANS AT THE MARKET, ROANOKE, VA.

dential section close by the incinerator, and two one-horse wagons which collect garbage and ashes in the business section. Also, five two-horse wagons collect ashes, cans and trash all over the city.

All the garbage trucks are covered with heavy canvas as soon as loaded, to prevent the scattering of garbage during the haul to the incinerator or to the dump, and also to present a more sightly appearance while driving through the streets.

The trucks work on streets in the business section in the morning, in the alleys in the afternoon, and finish the day with short residential routes. Each truck operates with only one helper, except in the business section, where particular effort is made for speed. The driver helps load when necessary. On the wagons the driver and helper both work, one loading from each side of the street.

Containers and Locations for Collection

In Roanoke, householders are permitted to place garbage and combustible rubbish in the same can. The container is required to have a minimum capacity of 10 gallons and a maximum capacity of 25 gallons. As originally written, the ordinance was intended to apply to garbage and rubbish, but it has never been enforced with respect to containers for rubbish.

The containers are placed in alleys wherever such exist. In the business section, material for collection must be placed out before 8 a.m., and everything is removed from the business section by 11 a.m.

Disposal

The city has a single Decarie incinerator which normally operates ten hours per day, but in summer has been required to run as much as twenty hours per day. It has been in service for eighteen years, and was repaired during the early summer of 1932 by rebuilding the steel shell from within and without. The work was done by the city's master mechanic with an oxyacetylene torch. This master mechanic is ordinarily employed at the city garage, which is on the same lot as the incinerator, where all city cars, road rollers and other mechanical equipment belonging to the city are serviced and repaired. The machine shop in the city garage includes among its tools a new South Bend Lathe Works lathe, a Manly press, and also drills, grinders and shapers, a power hacksaw and an electric welder.

The loads of garbage and rubbish received at the incinerator are not weighed but are recorded in cubic yards. The loaded trucks drive up a long concrete ramp to the right-hand entrance door on the second floor of the incinerator, drive around the two loading holes, dump their loads, and drive out of the left-hand door. One man is used on the charging floor, pushing the refuse into the loading holes alternately, and keeping the floors in a reasonably clean condition. Two firemen below handle the clinkering of the fires to maintain them in the best condition. Two American blowers driven by reciprocating steam engines with the power furnished from the furnace are used all the time the incinerator is in operation, to give a forced draft and induce a high temperature for complete combustion.

The city maintains two dumps, at one of which is deposited the garbage which cannot be economically hauled to the single incinerator. The garbage and rubbish are dumped in 8-foot lifts and covered with clinker from the incinerator and such dirt as is immediately available. As this dump is in a ravine, a road is cut in along the side of the ravine for the entrance of the trucks; then, as that lift is completed, another road is cut 8 feet higher than the first to take care of the next lift. A smouldering fire on the dump quickly consumes the dry and more combustible refuse.

At the clean-ash dump in another section of the city, all pieces of junk, such as remnants of automobiles, large pans, etc., are pushed over the edge of the fill, and the clean ash and street sweepings are dumped to cover them.

Quantities and Cost

During the fiscal year of 1931, a total of 57,093 cubic yards of refuse was disposed of by incineration and on the dump, of which about 35,000 yards was incinerated. A total of 68,924 cubic yards of ashes and trash was hauled to the dump.

The city pound sent 140 dogs to be disposed of at the incinerator; 560 dogs and 412 cats were hauled from all over the city, by city wagons, to be incinerated; and 118 dogs and 13 cats were delivered by citizens. In addition, 26 horses, 10 cows and 12 hogs were delivered by private citizens at the incinerator, and 5 horses and 12 hogs were hauled by city trucks. Private trucks hauled 1,060 cubic yards of paper and other rubbish to the incinerator for disposal. City trucks hauled 1,764 cubic yards of clinker and tin cans to the dump from the incinerator.

The cost for collecting, incinerating and otherwise disposing of garbage, trash and ashes in Roanoke, Va., for the year 1931 was $0.549 per cubic yard.

The collection and disposal of garbage, trash and ashes by incineration and dumping is handled by the Sanitary Department of the city, W. L. Sink, Superintendent, under the direction of W. P. Hunter, City Manager.

Don't "Economize" in the Care of Shade Trees

OUR trees are apt to suffer in these times when the cry is for reduction of expenses, warns the New Jersey Federation of Shade Tree Commissions (Kearny, N. J.) in a recent issue of *The Shade Tree*.

"In the first place, Mother Nature has not been kind to growing plants during the past few years. The summers have been dry and the winters open, so that trees have become more or less weakened and susceptible to insect and disease attacks. The elm leaf beetle has taken advantage of the weakened condition of the trees. . . . Borers are prevalent.

"Many of those who are caring for trees have found it necessary to curtail or completely stop fertilizing operations. Only during the past few years has the necessity for artificial fertilization become fully realized, and it is the duty of tree men to stand up and fight for the trees in order that they may not be unnecessarily neglected. Every department head probably considers that his department has insufficient funds to work with, but every shade tree commission and official should see that the readjustments are made equitably. . . . If a tree becomes weakened and is attacked by insects and decay it is a very difficult, expensive, and oftimes impossible task to bring it back to health and vigor again. Such conditions are bound to kill thousands of trees during the next few years if any let-up is allowed to occur in the caring for our shade trees."

An Unusual Sewage Treatment Plant

By W. M. VEITCH

City Engineer,
London, Ontario

THE new sewage treatment plant at London, Ontario, was designed and constructed without any thought of sludge digestion tanks or sludge drying beds. No provision was made for sludge disposal other than by incineration and that at a cost of less than 50 cents per ton of wet screenings burned. The new plant is the result of seven years' research and experimentation at the other municipal plant, most of which was confined to the question of sludge disposal. The population of the city of London, Ontario, is 73,000. The total sanitary flow from the city is approximately 7 million Imperial gallons per day, equivalent to 8.4 million U. S. gallons per day. All further references to flows and capacities in this article will be in U. S. gallons.

There are in London at present three sewage disposal plants giving complete treatment to this total flow. In 1920, a comprehensive plan for sewage disposal was decided upon providing that all sanitary sewage not capable of flowing to the East or the West End sewage disposal plants by gravity would be pumped to either one or the other. The scheme included two large disposal plants and numerous pumping stations. In 1923, a new survey was made and it was decided that it would be more economical in first cost as well as in maintenance and operation to have at least four small treatment plants and smaller pumping stations. Small treatment plants are more economical than larger ones and are easier to control. It is believed that further economies may be effected by operating garbage incinerators in conjunction with them.

Existing Plants

The West End plant, with which this article deals, is designed to give complete treatment to a maximum flow of 6 million gallons daily. The East End and the South End plants are each capable of treating sewage flows of one million gallons per day. The treatment at the East End plant is by two-story tanks and sprinkling filters; this plant is at the present time being enlarged and redesigned in part. It was originally built in 1916. The disposal of sludge from the two-story tanks is comparatively easy. We intend, therefore, that the present method of disposal on drying beds shall be continued. A large percentage of the sludge from the final settling tanks will, however, be incinerated.

The South End plant, built in 1925, operates as an ordinary activated sludge plant with sludge lagooning as a temporary—and most unsatisfactory—method of sludge disposal. This plant was designed so that it could be used as an experimental plant, and since its operation was started it has been the subject of many experiments. Unfortunately, however, the area served does not include any industrial works, so that all experiences have been based on domestic sewage only.

Pumping Stations

In addition to the three disposal plants, there are in the city four pumping stations providing sewer facilities for low-lying districts. These pumping stations are all operated by automatic float control. The automatic operation of sewage pumps and the coincident fluctuations in the flow through a sewage treatment plant of the activated sludge type makes it difficult to obtain the full efficiency of the plant. The control of the proper proportion of sludge return to the system is almost impossible under these conditions; either too much sludge is being returned during normal periods or too little during the temporary increases in the sewage flow. The flow to the new plant, which is normally 4 mgd, is raised to approximately 7 mgd for short periods. The sudden increase coincides with the pumping periods at the main pumping station, which average 7 minutes every half-hour. This serious fluctuation in flow is being considered, and preliminary plans have been prepared which show a replacement of one of the larger pumps by a smaller one; this smaller pump will operate continuously throughout the daytime at least.

Experiments with Screening Sludge

In 1926, shortly after experimental work had been started at the South End plant, it was decided to remove the excess sludge in its liquid form by mixing it with the raw sewage and passing it through fine screens. The theory—which has proved correct—was that the particles of sludge would adhere to the grosser solids in the raw sewage and be removed with them on the fine screens.

It was soon realized that the operation of the fine screens must be such as to obviate the possibility of the particles of sludge being washed or even brushed off the raw screenings to which they had adhered. It has been shown that the sludge percentage in the aeration tank can be maintained at the same level by passing the returned sludge through the screens for only 40 to 50 per cent of the total time. This must not be taken as a general statement, and must apply only to the concentration of sewage treated at London, Ontario, and the type of screen used there.

The panel type of fine screen was adopted. The panels, which completely fill the channel through which the sewage passes, are very slowly raised out of the sewage, like the paddles of a waterwheel. The screenings and sludge which have been deposited on the screenings material are not in any way disturbed until they are dropped into the hopper above.

Disposal of Screenings and Sludge

The fertilizer value of the sewage sludge has been investigated and it has been shown that the sale of the sludge as a fertilizer in London is not economical and practically impossible. Even the giving away of sludge in quantities

was questionable. The sludge must be first made suitable for transportation; then, as its application is only seasonal, it must be stored at the plant during summer and winter months. The worst feature of free distribution is that, once the sludge is given away, all control over its hygienic use is lost.

Investigations of the disposal of screening sludge by the separate sludge digestion process in London appeared to be expensive. Mechanical stirring, which would reduce the initial construction cost, seemed to be in opposition to the theory and would tend to produce a sludge which would be slow-drying and difficult to handle without odor.

Sludge drying beds naturally require a large amount of manual labor and more often than not are the source of odor complaints. Therefore, incineration seemed to be the more economical and inodorous method of disposing of the screenings and excess sludge.

An incinerator was built having a grate area of only 9 square feet. This small incinerator after four years of operation has operated without additional fuel once the fire was started with fuel, and it has been comparatively easy to burn the entire accumulation of screenings. The incinerator was more or less a temporary structure to aid in the investigation, and it has been partly rebuilt. Its size, however, will not be materially changed. From results obtained, it is expected that there will be no difficulty in disposing of 10 tons of wet screenings per day in this incinerator.

When activated sludge is intermixed with the raw screenings, the problem of disposal becomes more difficult. The moisture content of the screenings as they come from the screens, without draining or drying in any way, is approximately 87 per cent.

Investigations have been made as to the feasibility of pressing the screenings and so reducing the moisture content. Excellent results have been obtained experimentally with a simple screw press. With a pressure not exceeding 1½ tons, the value of the screenings was reduced to 43 per cent and the weight to 50 per cent. The moisture content was reduced from 87 per cent to 75 per cent. This reduction in the moisture content makes the stoking of the incinerator much easier, with a consequent reduction in the time of burning.

General Description of the New West End Plant

The first attempt at sewage disposal was made at the West End plant in 1901, when coke filter beds were constructed. These beds operated on the fill and draw system. Owing to serious overloading and lack of proper supervision, the beds were soon quite useless as a means of proper treatment. During the winter of 1925 and 1926, the coke was removed and used by the Relief Department as fuel. The filter beds have not been used in any way since.

In 1909 a plain sedimentation tank was constructed, to operate in conjunction with the filter beds; this tank was covered. In 1926 during a very severe thunderstorm the concrete roof fell in; and during the following year, the remains of the roof, the supporting pillars and division walls were removed and the tank was then used as a single unit 170 feet long by 152 feet wide with a sewage depth of from 9 to 10 feet. It is within this original tank that the new plant has been built, thus effecting a saving in excavation.

In 1927 the actual construction of the West End plant was begun, to extend over a period of five years. In 1927 and 1928 the grease trap, grit chambers, screen house and incinerator were constructed. This program also included a dwelling house for the chief operator, an office and storage building, fencing and a submerged outlet to the river. The treatment of the sewage from 1928 until 1930 was partial fine screenings followed by plain sedimentation.

The sewage enters the plant through a 48-inch diameter sewer, laid as an inverted syphon. A 20-inch cast iron pipe, also laid as an inverted syphon, delivers sewage to the plant from the main pumping station. Both sewers discharge into the bottom of the chamber, made large enough to allow the velocity of the sewage flow to be reduced sufficiently to release oils, grease and lighter solids from the sewage by flotation; the outlet from this chamber is also submerged. It has been found that the most effective method of removing this grease, which rapidly becomes foul, is manually with skimmers.

Diffuser plates have been installed in the bottom of the grease trap, and a gentle agitation by air assists the grease and floating material to reach the surface. The grease, oil and solid matter to which the oils adhere are disposed of in the incinerator immediately.

The grit chambers are 40 feet in length and 3 feet 6 inches wide. They are in duplicate and are of the simple channel type with hopper-shaped bottoms in the center. An open pipe 1 inch in diameter is laid to the bottom of each hopper. This pipe is connected to both the air and the water supply, so that either may be introduced at the base of the grit chambers. By the occasional use of either air or water throughout the day, causing a mild disturbance in the accumulations at the base of the hoppers, the organic matter which has been carried down with the grit is thrown into a suspension and carried away with the sewage. The grit chambers have been designed for a velocity of 1 foot per second at maximum capacity. Later a pump and sand washer will be installed over the grit chambers, so that the grit may be removed, washed and used for fill.

The sewage now passes through a Hankin coarse bar screen which is propelled by the sewage flow in the same way as a water wheel. The screen bars are set at ½-inch clear opening and are semi-circular in elevation, their radius being the same as that of the paddles. Combs which rake between the bars are set on each alternate paddle, and to each of these paddles cleaning bars are attached. The bars are operated in such a manner, through guides set in the side of the channel, that the solids are pushed off the comb as soon as it is clear of the top of the bar screen. A pit is formed behind the top of the screen bars to receive the screenings. The drainage of this pit is back to and through the bars. The screenings are removed manually after draining and are disposed of in the incinerator. Hankin fine screens have been installed. The effective size of the panels is 5 feet by 18 inches, and the screening medium is commercial galvanized iron wire mesh with ⅛-inch square openings.

The aeration tanks are rectangular in plan, 50 feet long, and 7 feet 6 inches wide, and carry a depth of 9 feet 6 inches of sewage. The tanks are laid out in two sets of twelve each, allowing the plant to be operated in sections. Any one of the 24 tanks may be cut out of service without affecting the operation of the remainder. Liner plates

have been placed in the concrete at the sewage line. These are vitrified flat plates 18 inches in length by 9 inches wide by 1 inch thick. They are laid as a continuous row 9 inches deep, 4½ inches above the sewage line, and 4½ inches below. The detention period in the tank is 1.8 hours.

The main air and drainage piping throughout the plant has been welded, the smaller sizes having also been welded into the larger. All piping under 2½ inches in diameter has been built up with screwed fittings, as this was found to be less expensive and quicker than welding, because of the many fittings which had to be introduced.

The sewage pump is a 5-inch vertical centrifugal Fullway pump made by the Pulsometer Engineering Co. and capable of delivering 720 gallons per minute against a head of 15 feet. The main air lifts for the elevation of the sludge from the clarifiers are also located in the pumphouse. The pumping of sludge is possible either in conjunction with the air lifts or in place of them.

Three Ingersoll-Rand compressors are in operation. These are of the horizontal type, and two machines are capable of delivering 1,000 cubic feet of free air per minuate at 10 pounds pressure, while the third will deliver 1,500 feet under similar conditions. The two smaller machines are operated by 40-horsepower Lancashire motors, and the larger machine by a 60-horsepower motor of the same make. The drive units are short Tex rope drives.

The air piping and compressors are so arranged that any one or two machines may deliver air to one half of the plant while the remaining unit or units supply air to the other half. This is controlled by 8- and 10-inch brass-mounted glove valves. It is therefore possible to deliver air to either half of the aeration tanks at the rate of 1,000, 1,500, 2,000 or 2,500 cubic feet per minute, or, should only one half of the plant be in operation, the full capacity of the compressors, 3,500 cubic feet per minute, may be delivered to the half in operation. The air is diffused by Filtros plates 6 inches wide, Activated Sludge Ltd. plates 4½ inches wide, and 1¼-inch pipes perforated at the plant.

The two settling tanks 50 feet square provided are equipped with Hankin-Fiddler scrapers of the twin spiral type. The detention period is one hour and 12 minutes at 5 mgd.

The Incinerator

The screenings and sludge incinerator has a fire-grate area 3 feet square, with a drying surface at the back of the grate 4 feet square. The screenings are dumped on the drying area through a charging hole in the top. The partly dried screenings are raked forward onto the fire by hand as occasion demands. At the finish of each day's burning, the drying area is allowed to remain full of screenings, so that when the fire is re-lighted, the screenings which were left over and have been partly dried make a good start for the new fire. This operation also reduces the amount of fuel required. A chimney 45 feet high and 4 feet in diameter at the base was built to serve the incinerator. A small ¾-horsepower blower provides the forced draught, which is used occasionally.

The Screenings Press

The screenings press is a perforated 12-inch pipe. A piston ram with a short stroke moving slowly and continuously supplies the pressure. A hopper is welded to the top of the pipe near one end. The other end is reduced in sectional area gradually by a taper piece. The ultimate size and length of this taper was determined by experiment. The only outlet for the compressed screenings is through this pipe of smaller diameter, the size of which determines the amount of pressure exerted on the screenings.

The Outfall Sewer

The outlet sewer from the plant is 48 inches in diameter and is laid to the river bank, where it terminates in an overflow chamber. From the bottom of this chamber a 24-inch cast iron pipe is laid at a steep grade extending 20 feet to the center of the river, the depth of the water being 8 feet. The cast iron pipe has flexible ball-and-socket joints, and the last section is a 24-inch bend on a heavy base. The mouth of the bend is directed upwards.

Cost

All the experimental equipment and machines were made in the machine shop at the sewage treatment plant. The construction was done entirely by day labor under the direction of the engineer in charge of sewage disposal. Most of the concrete in the aeration tank and clarifiers was placed as an unemployment relief measure during the winter of 1930-31.

The cost of the plant up to the end of 1930, which included the major portion of the preliminary treatment works, was approximately $54,600. The total cost to the end of 1931 was $135,000. The estimated cost still necessary to complete the plant is $54,500, making a total expenditure of less than $190,000.

The maintenance force at the plant during 1931 was four men, which may be reduced to three. The amount of fuel required for screening and sludge disposal for 1931 was 750 pounds of coal per week, which gives a cost of less than 35 cents per day.

ACKNOWLEDGMENT.—From a paper presented before the New Jersey Sewage Works Association.

Missouri Planning Conference Organized

THE organization of the Missouri Planning Conference on a permanent basis took place on December 17, 1932, with Judge H. S. Truman, of Independence, presiding Judge of the Jackson County Court, as President, and Martin Lewis, of Jefferson City (the headquarters) as Acting Secretary. Harland Bartholomew, of St. Louis, is Chairman of the Consulting Committee. One of the primary purposes of organizing the Conference was to secure state-wide support for several planning acts which were submitted to the Legislature in January. Three proposed planning laws were discussed at the January 14th meeting of the officers, directors, and Consulting Committee, and copies of these bills, with a brief explanation, were sent to the presiding judge of each county court where the county population is more than 25,000, with the request that the judges study the laws and send their findings to the Conference. The three bills include: a proposed city planning act permitting the adoption of an official city plan and the establishment of building lines under the police power for future street widenings; a proposed county planning law permitting the adoption of an official county plan; and a proposed county zoning act. Similar acts failed of passage two years ago because of lack of well-organized support.

EARL O. MILLS.
City Planning and Zoning Engineer, St. Louis, Mo.

Rigid Frame Bridge on Main Traffic Route in Los Angeles Metropolitan Area

A VIEW OF THE CANADA BOULEVARD RIGID FRAME CONCRETE BRIDGE, SHOWING THE FLAT ARCH DESIGN

Wooden Trestles Weakened by Termites Replaced with Concrete Structure

By **J. C. ALBERS, Assoc. M. Am. Soc. C.E.**
City Engineer, Glendale, Calif.

THE city of Glendale has recently completed a reinforced concrete bridge of the rigid frame type on Canada Boulevard across Verdugo Wash. It replaces the wooden pile trestle that had become unsafe owing to the action of the subterranean termite, a very destructive tropical wood-boring ant. The new bridge, constructed with funds appropriated by Los Angeles County, constitutes an important step toward the completion of one of the main traffic routes in the Los Angeles metropolitan area to La Crescenta Valley.

Few bridges of the rigid frame type have been constructed in the West, although a number have been built in other parts of the country. The Park Commission of Westchester County, N. Y., has quite generally adopted this type of bridge, and its engineering staff has contributed much to its development. Also, in San Antonio, Texas, a reinforced concrete rigid frame bridge embodying several unique design features was built recently. As the economy and adaptability of this type of bridge are better appreciated, its use is becoming more common.

The economy of rigid frame bridges is dependent upon the interaction of the deck with the abutments, accomplished by constructing heavy knees integral with the abutments and deck. The deflection of the horizontal member of the frame is materially reduced, owing to the rigid connection, thereby reducing the total work done by the structure and efficiently using all the materials in the bridge. Earth pressure on the abutment assists in sustaining the loads on the bridge. The center or crown section, being relieved of some of the stress by the abutments, becomes quite slender, while the supports or knees are heavy, producing a structure which is similar in appearance to a flat arch and permitting the same architectural development.

The Canada Boulevard Bridge

The Canada Boulevard Bridge resembles a flat barrel type arch, constructed on a skew of 35 degrees. It has a clear span of 52 feet 3¼ inches along the center line of roadway and a right angle span of 43 feet. The roadway, 58 feet wide, flanked on each side by a 5-foot sidewalk, is paved with a 5-inch two-course asphalt concrete laid on a sand cushion. Utility ducts for telephone and street-light conduits and water and gas mains are provided beneath the sidewalks without exposing them to view and detracting from the appearance of the structure. These ducts are drained and ventilated, and access to them is gained by means of manholes.

To determine the bearing power of the soil, four test holes were dug to the proposed elevation of the footings. The soil at that level is sand and gravel, with occasional small streaks of clay. The same type of soil prevails six feet below the foundation elevation, as shown by borings. No water was encountered, indicating good drainage conditions. Bearing tests were made in each hole by means of a 12-inch by 12-inch column and platform loaded with sacks of sand. The load was applied in 1,000-pound increments, each 15 minutes, until a pressure of 6,000 pounds per square foot, twice the design load, was reached. This load was permitted to remain for 54 hours, when it was removed in the same increments. The load was again applied as before and the holes were finally filled with water. No attempt was made to load the ground on each side of the column to prevent bulging. The maximum settlement was ¼-inch and the minimum 1/5-inch.

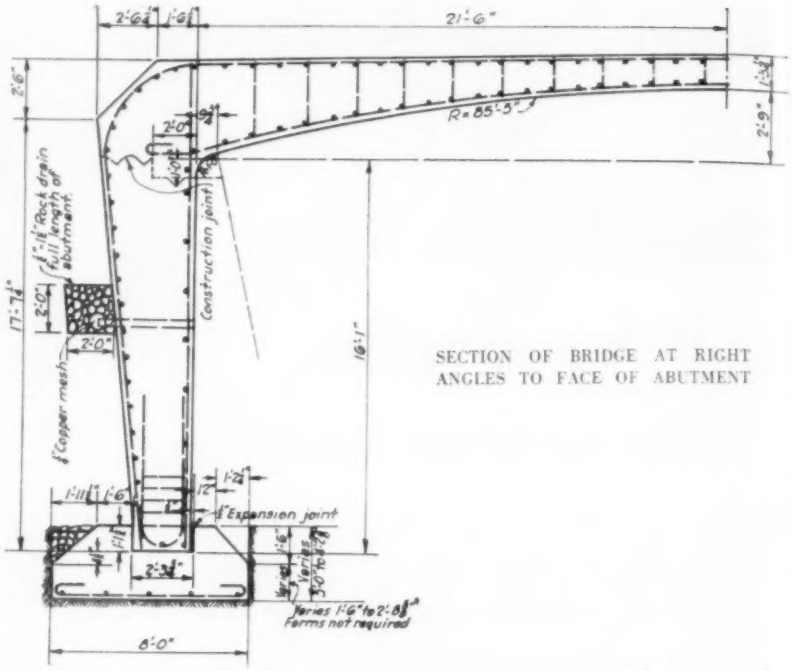
The footings and abutment walls are constructed independently of each other, there being no positive connection between them other than a large keyway, which provides restraint only in the direction of the thrust of the frame. Any possible uncertainty in the moment distribution in the frame due to the influence of a fixed connection between the footings and the abutment walls is avoided. This construction is in effect a hinge joint and relies on the resiliency of the foundation soil in relieving and redistributing any uneven pressure caused by temperature or loading conditions.

In the design of the deck slab of a skew span such as this one, the transverse reinforcement is considerably heavier than required for a right frame. This steel is

necessary to resist the stresses caused by the warping action under load and distributes the load in the direction of the center line of the roadway. Adequate provision for these warping stresses is the key to the successful use of the barrel type rigid frame bridge when the structure must be built on a skew.

The wing walls of cantilever design extend straight back from the main structure and are kept entirely free from it by wide expansion joints. The cast-in-place concrete handrail is of the lattice type. It was rubbed down with carborundum and marble stones before the concrete had fully hardened.

Forms for all exposed surfaces were of grade C fir flooring, set so that board marks conformed to the same grade as the handrails. Careful attention to form construction and the alignment of the form boards contributed much to the appearance of the bridge. Handrail forms were made of five-ply veneer so as to minimize the amount of rubbing required to produce a smooth surface.



SECTION OF BRIDGE AT RIGHT ANGLES TO FACE OF ABUTMENT

The bridge was designed to carry a platoon of 20-ton trucks, preceded and followed at 30-foot intervals by 15-ton trucks. The design stresses used were 18,000 pounds per square inch for intermediate grade reinforcing steel, and 800 pounds per square inch for concrete. The concrete was nominally a 1:2:3 mix, and tested from 3,600 to 4,000 pounds per square inch at 28 days, more than justifying the design stress. All cement and steel was tested. No admixtures were used, since careful proportioning and the richness of the mix gave the desired workability.

Central-Mixed Concrete Used

The concrete was mixed in a central mixing plant about one-half mile from the bridge site. The plant consisted of a six-sack mixer, a sand inundator, and volumetric rock batchers for two sizes of coarse aggregate. The maximum size rock was 1½ inches.

The mixed concrete was transported to the job in trucks, where it was dumped into a specially designed hopper which was moved to the required position by means of a crane with a 50-foot boom. The hopper was so constructed that the flow of concrete could be readily controlled. This resulted in an even distribution of material and freedom from rock pockets or flow lines.

The concrete for the arch section, consisting of over 400 cubic yards, was placed in one continuous operation and required 22 hours to complete. All concrete was water-cured 14 days, a most important consideration in the reduction of shrinkage stresses.

The bridge was designed and built under the direction of the author as City Engineer. The architectural and structural design was made by C. D. Ament, of the City Engineer's office, who also acted as resident engineer during construction. The calculations and design were checked by Professor R. R. Martel of the California Institute of Technology. Mittry Brothers Construction Co. was the contractor on the bridge, the total cost of which, including incidentals, was $21,261.81 and involved 1,000 cubic yards of concrete, indicating the economy of this type of construction.

Civic-Club Campaigns for Better Housing Increase Employment

CIVIC organizations in some 80 cities and towns over the country have sponsored community-improvement campaigns to increase comfort and attractiveness in the home and at the same time aid employment of local building tradesmen, according to current reports received by the U. S. Department of Commerce.

These local civic clubs, including chambers of commerce, women's clubs, veterans' organizations, luncheon clubs, and various professional and fraternal societies, determined that the stimulation of employment, particularly in the building field, through a collection of small home repair and improvement jobs, which individually may only amount to a few dollars, is substantial, since on the average it is generally assumed that at least 50 per cent of expenditures for this work are paid directly in wages. Educational better housing campaigns also provided a worthy objective in the encouragement of thrift through sound investment in carefully planned home improvements.

As an example of the variety of work secured, a civic campaign in a mid-western city of only 10,000 people included such work as painting, paper hanging, re-roofing, plastering, tiling, plumbing, flooring, masonry, replacing window glass, repairing stone work, walks, roadways and fences, and the planting of new shrubs and trees. More than $100,000 was spent in three months, and some of the larger projects were not completed in that time.

Detailed information concerning methods used in various cities conducting these campaigns, as well as information particularly for home owners, may be secured from the Home Modernizing Committee of the Department of Commerce. This Committee is composed of 17 voluntary members who are recognized experts in the housing field and who act as an advisory group of the Division of Building and Housing in the Bureau of Standards.

Are Local Expenditures Excessive?*

By HAROLD S. BUTTENHEIM
Editor, The American City

IT has become fashionable to decry government and taxes. Demands for indiscriminate budget-slashing are the order of the day. So-called economy leagues are springing up all over the country. Embattled taxpayers are organizing strikes. Fluent orators are taking the air to attack government and the costs of government.

If this rising wave of propaganda were a real aid to constructive economy; if it were generally based on scientific analysis; if it were consistently advocating advancing standards of governmental services with elimination of waste, inefficiency and graft—it would be a wholesome and desirable thing. Such is far from the case. The movement in some of its aspects is almost anarchistic in its tendency to cripple the beneficial activities of public bodies. A depression which persists because we are spending too little is widely proclaimed to be curable by spending even less.

Ratio of Governmental to Individual Expenditures

Even if government were static, yielding up year after year the same type, quality and per capita measure of service, we could not rationally assume that its costs should rise and fall in proportion to the population. Increased population decreases the per capita cost of some governmental services and increases that of many others.

The exact relationships that are desirable between population, national income and governmental expenditures still remain to be demonstrated. If we do not know what such relationships ought to be under a static system of governmental service, how much less can they be dogmatically determined in the face of our rapidly expanding governmental activities, brought on by the demands of the machine age and a developing social conscience, as well as by normally rising standards of community living. It may very well prove to be wise social policy to take an increasingly larger share of the total income for public works construction, cultural and recreational services and other governmental purposes.

If our budget-slashing advocates could go back 200 years, they would find the costs of city government in this country extremely moderate. Local public responsibilities would then consist almost entirely of providing for roads and highways, wharves and harbors, and public safety and justice. The citizens of that day would not be taxed for sewerage, garbage collection, fire protection, traffic control, public health activities, public schools, parks, playgrounds, libraries or museums. I doubt that even the most rabid of our present "economy" advocates would favor the abolition of any of these services. Yet they were accepted as proper governmental services only gradually and in spite of bitter protests from the reactionaries who even in the old days were lamenting rising tax rates and the increase of governmental functions.

What the Taxpayer Gets for His Taxes

In 1930 the average citizen in places of over 30,000 in the United States paid $47.82 for the support of his local government, including schools.† Was it worth it to him? For this sum a policeman would respond to his call for help at any hour of the day or night; a modern fire engine would speed through the streets to his rescue at the slightest hint of danger; laboratory technicians were on constant duty testing the water he was to drink to be sure that it was wholesome; doctors and nurses safeguarded the health of the community and thereby prevented his exposure to many infectious diseases; his children were provided with schools, teachers and playgrounds; parks, libraries and museums were maintained for his recreation and assistance; streets were paved and kept clean and lighted for his convenience; his life was protected and travel was facilitated by traffic regulation; his garbage and ashes were collected from his back yard and in some cases from his cellar; and that destitute family down the street whose desperate plight preyed on his mind received relief. Was all of this worth $47.82 per year? Certainly on the criterion of the value of what his city does for him, the taxpayer had no cause for complaint.

But even granting that these services are worth more to the taxpayer than he pays for them, the question arises as to whether, through increased efficiency, the governments could not have rendered an equal measure of service for a reduced cost.

Undoubtedly in many cases that is true. Perfection of method and impeccable honesty have been no more attained in government than in other fields. Moreover, cities vary in this respect as widely as do private corporations. For one high-grade, efficient business unit conducted on ethical lines, there may be found a number of inefficient or unscrupulous companies. There are many cities in this country being conducted on a high plane of efficiency. There are others whose methods of procedure constitute a blot upon our government. A comparison of efficiency and ethical standards as between business and government is exceedingly difficult, but there is no reason to believe that the former is generally superior, despite the widespread assumption in this respect. Government exists under a spotlight of publicity, so that the weaknesses of its officials are kept before the public eye. It is desirable that the steadiness and brilliance of this spotlight should be increased and that every effort should be made to eliminate waste, graft and inefficiency wherever revealed. We must, nevertheless, rejoice in the fact that we have a great army of conscientious and loyal public servants (too frequently discredited by the aberrations of a few) and that they are constantly rendering us invaluable services which we could not afford to be without.

Government officials need more constructive suggestions and more sympathetic cooperation than they are accustomed to getting from the public. Instead of forcing upon the government a ruthless demand that 10, 15 or 25 per cent of the budget must be slashed regardless of consequences, the governmental program needs to be studied intelligently, so that any inevitable paring down will come where it does the least harm.

The citizen makes no similar expenditure which brings to him such rich returns, in good times or bad, as his tax dollar. For those of us in public life there must be no compromise with waste and graft. Nor for those of us in private life must there be toleration of the anti-governmental propaganda, ill-founded and pernicious in its effect, which is now being so widely circulated. The standards of our American communities must be maintained and advanced.

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* From a paper presented before the New York University Conference on Taxation, Readjustment of Governmental Expenditures and Problems of Public Credit, December 5, 1932. The complete paper has been published in the January issue of *The Municipality* (the organ of the League of Wisconsin Municipalities), Madison, Wis.; and in *The Kentucky City* (published by the Kentucky Municipal League), Lexington, Ky.

† Financial Statistics of Cities, 1930, p. 226.

A Water-Supply Project Involving Pumped Storage

Increased Storage Provided by New Hoopes Dam and Reservoir of the Wilmington, Del., Water Supply

A WATER shortage in an industrial community is almost as serious as the possibility of a food famine. As far back as 1925 the Board of Water Commissioners of Wilmington, Del., realized that the growth of the city depended on its industries and that the flow of the source of water supply, Brandywine Creek, was not increasing with the demands upon it by the city to furnish water to its citizens and industries. In 1925, Fuller & McClintock, consulting engineers, of New York, were called in by the Water Board to report on additional water sources, with the advice of the Chief Engineer of the Water Department. While that report made no mention of the Hoopes dam project which has just been completed, the scope of the report led to the ultimate suggestion of pumped storage as the most economical method of securing additional water supply for the city of Wilmington.

Outline of the Project

In spite of double pumping over a ridge between the source of supply and the storage reservoir, and return the same way, the Hoopes dam project remained the most feasible of all methods studied. Water is taken from Brandywine Creek during periods of high flow, that is, periods when the flow of the creek is greater than the requirements of the city water supply and is of a satisfactory quality. It is pumped by the old Brandywine pumping station, using the two Holly triple expansion pumping engines, through a 43-inch Lock Bar steel pipe and a 42-inch Lock Joint steel cylinder reinforced concrete pipe.

The water is stored in the new two-billion-gallon Hoopes reservoir, from which it is to be drawn and pumped back through the same force main to the city to Porter Reservoir, and thence to the slow sand filtration plant, or to be released into Brandywine Creek, flowing to the rapid sand plant for filtration.

The Hoopes Dam

The entire project, including the dam and reservoir, has been named the Edgar Hoopes reservoir, for Edgar M. Hoopes, Jr., Chief Engineer of the Wilmington Water Department from 1913 to 1918 and then a member of the Water Board from 1921 until his death in 1931. He was greatly interested in this project. At the end of the dam a suitable memorial is being erected, in order that future generations may know that the great project which is located only five miles from the center of the city, and which will eventually become a beauty-spot for the citizens of Wilmington, was instituted by an engineer who contributed much to the welfare and building of the city.

Construction of the full section concrete gravity dam was started by the successful bidder, the Northport Sand and Gravel Co., of Northport, Long Island, N. Y., early in November, 1929, and actual concreting began in June,

SCENES AT THE NEW HOOPES DAM AND PUMPING STATION

1. The dam as seen from the pumping station, showing the central spillway. 2. The field stone pumping station, with the dam in the background and a portion of the park at the right. 3. Interior of the pumping station

1930. The dam is 900 feet long, and 135 feet high from the bottom of the concrete core wall to the top of the dam, and will impound water to a height of 100 feet. The top of the dam is 16 feet thick, with a walk 19 feet wide on top, cantilevered equally on both sides. The dam is 90 feet thick at the bottom in the maximum section. The cut-off trench for the core wall is 8 feet wide by 10 feet deep and is entirely in rock. The dam has no gallery, and there are no drainage structures within the dam.

Special features of the construction of the dam were the use of bulk cement instead of bagged cement, resulting in a saving of $7,000 to the city, and the use of Conveying Weigher belt conveyors for the handling of the concrete from the central mixing plant to the forms. The placing of concrete in the dam proper was completed by the early part of February, 1931, and the complete placement of concrete, amounting to 105,000 cubic yards, was finished early in March, 1931.

It had been originally planned to use steel sheet piling in the west hillside as a cut-off, but excavation showed that it would be more satisfactory to continue the concrete core wall into the west side. The entire work on the dam was completed by the end of May, 1931, and the final estimate, amounting to $1,124,000, was prepared.

A gate house is built as an integral part of the dam and without a superstructure. It contains draw-off gates at three elevations. Except the cut made below the original surface, the dam stands as a full height structure in view of the public, without fill on the downstream face. All the excavation from the site was spread in the valley below to give a flat area for later landscaping.

A spillway is built into the dam at the center of the structure. It is 25 feet wide and is spanned by the walkway. As the watershed of the reservoir is only 2 square miles, there is little need of an extensive spillway structure. The spillway is merely the open section at the top, and the water is permitted to run down the face of the dam, confined between two guide walls 3 feet wide by 4 feet high. The spillway runs into a flume, 6 feet square inside measurement, into which the blow-off from the dam also discharges. The flume is 600 feet long.

In the construction of the dam, concrete of a designed mix which was approximately 1:3:6 was used with a 1:2:4 veneer. All the backfilling was puddled.

The Reservoir Site

The land to be flooded by the impounded water included a notable landmark, the Old Mill, which had been developed by the late Coleman duPont as a refectory for his guests. It was necessary to purchase 480 acres of land from 11 owners either outright or by condemnation. The flooding required the relocation of 2½ miles of roads and the construction of an earth dike at the upper end of the reservoir, the top of which will serve as a roadway and which will also create a pool of about 36,000,000 gallons. This dike, about 1,000 feet in length, has control gates at either end and is 30 feet high. The local landowners complained of the possibility of mud flats in time of low water in the reservoir, so this pool was created to overcome that objection. At the center of the dike is a 36-inch blow-off valve for emptying the pool if the water is urgently needed by the Water Department. The dike is riprapped from the bottom to within 10 feet of the top, where it is paved with concrete.

QUANTITIES AND UNIT PRICES

Clearing and grubbing	20 acres	$	100 00
Excavation and disposal of material			
Class A	10,000 cubic yards		.58
Class B	1,000 cubic yards		3.00
Class C	25,000 cubic yards		.85
Class D	7,000 cubic yards		1.03
Class E	18,000 cubic yards		1.15
Class F	10,000 cubic yards		1.50
Consolidating fills	25,000 cubic yards		.48
Sheeting and timber left in place	20,000 feet BM		30.00
Cement	140,000 barrels		2.46
Concrete—Class X	700 cubic yards		14.00
Concrete—Class Y	14,000 cubic yards		5.50
Concrete—Class Z	88,000 cubic yards		5.80
Rubbed finish for concrete	82,000 square feet		.02
Concrete surface hardener	18,000 square feet		.016
Steel reinforcement	90,000 pounds		.055
Drilling holes in rock or masonry	2,500 feet		17
Grouting	2,000 cubic feet		2.00
Cast iron pipe—straight	11 tons		60.00
Cast iron pipe B&S castings	3 tons		195.00
Cast iron pipe flanged	1 ton		135.00
36-inch steel pipe	430 linear feet		15.75
Steel castings	Lump sum		102.00
Gate valves	Lump sum		3,050.00
Sluice gates	Lump sum		8,500.00
Steel plates for construction joints	105,000 pounds		.035
Copper plates for expansion joints	2,500 pounds		.40
Miscellaneous CI work	2,600 pounds		.10
Miscellaneous steel work	7,500 pounds		.23
Small steel pipes	1,500 linear feet		.18
Steel sheeting	200,000 pounds		.05
Railing on dam	1,700 linear feet		6.00
Railing for stairway and walk	400 linear feet		2.50
Broken stone filling	600 cubic yards		3.00
Total		$	1,090,197.50

The Pump Station at the Dam

Provision for the return of the water to the city has been made by the installation of three 4-mgd American Well Works centrifugal pumps driven by Buffalo gas engines. It was found more economical to install the gas-engine drive than to pay the high ready-to-serve charges for electric current, as the station will be used only during the dry months to pump water back to the city when the flow in Brandywine Creek is inadequate. The pumping station is built in the most modern manner with every safety device for the operation of equipment.

The force main from the city through which the water is also returned runs along the east wall of the station, and in this line a Simplex venturi meter is located, with recording apparatus for measuring the flow in both directions. The main continues on to the reservoir with a Y-branch leading to the suction of the three pumps. Several Rensselaer valves are so arranged as to control the flow to and from the reservoir, the station providing a flexible system. The suction line is equipped with an Andale strainer for the removal of twigs from the line, which is self-cleaning while in service. The frequency of cleaning is controlled electrically from two minutes to four hours. When the period of cleaning is due, the flow of water under high pressure is reversed in the upper half of the revolving screen, and the accumulation of twigs, through an automatic shifting of valves, is flushed out into the flume. All the piping in the pumping station, including the specials, was furnished by the U. S. Pipe and Foundry Co. The station is equipped with a Maris Bros. 5-ton hand crane running on tracks set in the walls. This crane was used in setting the pumps and engines and can be used for all maintenance work in the future.

An interesting detail of construction was noted in the placing of the blanks for the suction and discharge of a prospective fourth pump. A double bell casting was set in the wall, with the two faces flush with the two sides of the wall. This casting acted as a 24-inch sleeve, and the nipples from the outside main and the inside blank were run in from the two sides and a space of about an inch left between them when they were placed with the poured lead joint. In case of settlement, the lead joint will take

A PORTION OF THE PARK AREA ADJACENT TO HOOPES DAM

up any slight change in alignment without damaging the pipe. In order to prevent a blow-out of the inside nipple, eight 1-inch tie bolts were run from the blank flange to the sleeve set in the wall. There were only six bolts on the discharge side, where the pressure was less.

Landscaping the Area

It has been the intention of the Water Board to beautify the site of the Hoopes dam, and work has already started, using unemployed labor from the city. In order to provide easy access to the top of the dam, where the view up the valley is very attractive, it was first planned to build a continuous flight of concrete steps near the face of the dam at a cost of $4,800. By using unemployed labor and carrying the steps through the nearby woods with broken flights and long ramps of slight grade, the steps were completed, including several stone benches and a natural stone bridge, at a cost of about $3,000.

This work was instituted in 1929, with W. Compton Wills, Deputy Chief Engineer in charge of construction. Early in 1932 Mr. Wills became Chief Engineer of the Wilmington Water Department. I. F. Story was resident engineer in charge of work in the field for the Water Board, and Elmer G. Manahan, of Fuller and McClintock, was in charge of design and supervised construction for the engineers.

Pathmasters Are Past

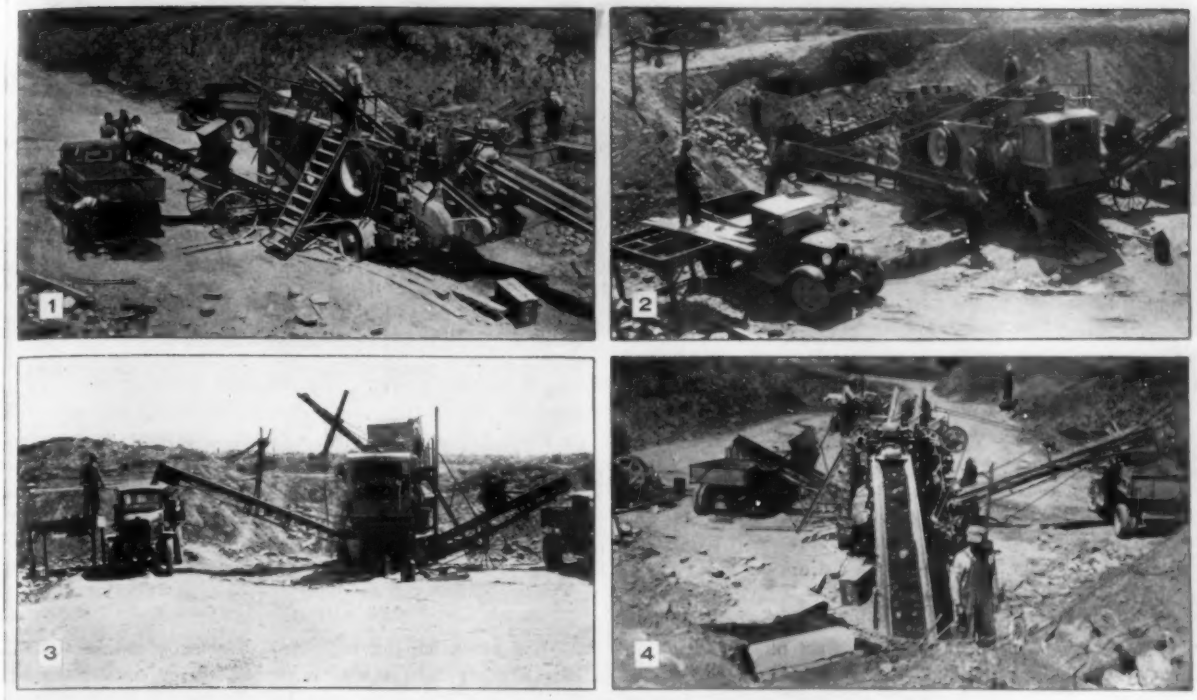
Brown County, Wis., Has Reorganized Its Road Maintenance for Increased Efficiency

THE old pathmaster system of road maintenance in Brown County, Wis., was discarded three years ago. Under the old system the town was divided into five or six road districts, each with its pathmaster who looked after his own district regardless of the needs of the remainder of the county. Under the new system, the county maintains all the roads, and the $25 per mile per year which the townships were receiving from the state gasoline tax is paid to the county for this work. As a result, the township made a saving of $2,000 to $3,500 in 1931, and its roads were at all times well maintained.

Where a large percentage of rural mileage is under the jurisdiction of the township, economic progress requires a spirit of cooperation between the township and the county. These relations depend upon the county's establishing practices that will demonstrate to taxpayers and township officials the benefits of competent supervision and modern maintenance methods. Three years of the town road maintenance by the county in Brown County, Wis., under the direction of George J. Cormier, County Highway Commissioner, has convinced the most skeptical observer that the ideas are sound.

The cost to each town for the maintenance of township roads is that town's share of the gas tax fund, which amounted to $170 in villages, and from $465 to $1,700 in the towns. It was not easy to figure just what the maintenance would cost. The state and county trunk roads were being maintained with six motor graders, and it was figured that six more would be needed to handle the town roads. The extra graders were purchased and met requirements, and the cost was about $1,400 per year to operate. Each machine works in one and one-quarter to one and one-half townships, and maintains about 60 miles of road, working 15 to 25 miles per day. Each section is gone over at least twice each week and sometimes more often. Some of the patrolled sections are part state, part county, and part town. By an arrangement made with the State Highway Commission, Brown County found it possible to combine a few of the sections and by so doing saved the purchase of extra motor graders to handle the town road work.

Brown County has 900 miles of town roads, 182 miles of state trunk roads, 240 miles of county trunk roads, and 70 miles of city streets, a total of 1,392 miles. All new



METHOD OF PRODUCING SPECIFICATION GRAVEL IN BROWN COUNTY, WIS.

1. The No. 100 Western crushing and screening plant of Reinke and Jorgenson, showing sand removal at the left. Crushed material is being loaded into the truck at the right. 2. A view of the front of the plant. 3. Another angle, showing the pit and shovel in the background. 4. The rear of the plant, showing the conveyor to the crusher

construction of roads and bridges is let by contract. All state trunk roads are maintained by county forces under state supervision. There are 240 miles of concrete roads in the county. In 1932, the specifications for gravel and stone roads were changed, and all materials must be crushed to ¾-inch size. Wisconsin is fortunate in the possession of excellent gravel and stone deposits, and the preparation of material needed by townships and counties for road construction has grown into a great business.

When bids were opened in the summer of 1932 for gravel work in the towns of Bellevue and Allouez, the contract was awarded to Reinke and Jorgenson. The low bidder on gravel delivery for the town of Humboldt was a farmer who had a remarkable gravel pit on his property but who was unable to meet the new specifications with his crushing plant. As the contractors were operating a new Western No. 100 crushing plant, the farmer arranged with them to do the crushing.

The illustrations show the portable plant at work in the pit, furnishing material for both contracts, in accordance with state specifications. The pit runs 50 per cent oversize on a ¾-inch screen and about 22 per cent sand. Like most gravel pits, this pit does not run uniform, and occasionally the dragline by means of which pit-run material is delivered to the plant encounters too much sand to conform to the specifications. Whenever that happens, the inspector merely shifts the sand lever without stopping the plant. The sand in excess of the 30 per cent allowed by the state is then delivered to a truck on one side of the plant, while the delivery of the crushed material continues as before to the waiting dump trucks on the opposite side.

Elimination of Waste—Not Curtailment of Needed Services—Is True Economy

THE continued existence of a democratic society depends upon the maintenance of those educational, cultural and social institutions which have been created to promote general education and wholesome living. The service of such institutions must not be destroyed.

The need for economy is recognized. In many cities, counties and states the unit cost of governmental services can and should be reduced. All taxing units should be required to live within their incomes except for permanent improvements and emergencies.

A wholesale horizontal cut applying to all departments and activities is one of the least desirable ways of reducing, for it cannot be assumed that all departments are equally efficient and all activities equally important. Before reductions are made there should be a study by disinterested specialists and citizens to determine (1) what cuts can be made without limiting important services, and (2) the relative importance to the public of the various activities. We will welcome such investigation of the institutions and activities we represent.

We pledge our cooperation to forward-looking public administrators in their efforts to find permanent solutions for the taxpayer's problems, through the complete elimination of the spoils or patronage system in all governmental activities where it exists; through the improvement of the personnel; through the reorganization of areas and functions of government; and through improved methods of taxation. The elimination of waste should precede any curtailment of socially useful services.

—A statement adopted at the Midwinter Conference of the Council of the American Library Association, in Chicago.

The Efficiency of Street Cleaning

By **H. W. KUEFFNER**

Director of Public Works,
Durham, N. C.

DURING the past thirteen years in Durham, N. C., several methods of street cleaning have been used. In the beginning of that period a change was made from the gang of laborers with push brooms, scoop shovels, carts, horse-drawn sweeper and sprinkling cart to the motor flusher and the motor pick-up sweeper. In 1921 the cost records disclosed that the antiquated methods were costing $8.795 per thousand square yards. In August, 1921, the first motor pick-up sweeper was put in operation. The cost varied between 12 and 15 cents per thousand square yards. One year later two sweepers were used. The cost of all supplies and repairs is included in the figures given above but nothing is included for depreciation. The first sweeper was operated for ten years, so that about 2¼ cents should be added to the cost per thousand square yards swept, to cover depreciation.

Until a little more than a year ago, a flusher was operated on schedule one day later than a sweeper. The purpose of this was to get all the fine dust off the street surface which the sweepers had failed to pick up. An endeavor was made to eliminate this duplication of street-cleaning expense by using a vacuum type of street sweeper, but its use was abandoned in a few months. Then a change was made from coarse broom filler to a very fine cut, and it was possible to eliminate the flusher as a follow-up of the sweeper.

The two motor sweepers in Durham keep 70 miles of paved streets clean. Some of these streets are cleaned daily, some only once a week, and others two or three times a week, depending on how frequently cleaning is required. Each sweeper has a regular daily route and is equipped with a locked recording clock. The wax-coated dial of this Servis Recorder gives an accurate report of the working of the equipment. The scheduled route as completed furnishes the mileage record for the daily and monthly sweeper reports, and the dial of the Servis Recorder furnishes the record of the actual hours worked.

Factors Increasing Street-Cleaning Efficiency

The efficiency of a street-cleaning system depends on: (1) the use of proper equipment; (2) careful operators interested in their work; (3) daily cleaning, adjustment, and care of the equipment; (4) a proper work schedule. Officials in charge of street cleaning can determine the most efficient street-cleaning equipment by investigation of the various equipments used, and comparing their records. Careful and interested operators can be developed by keeping the operators informed of the cost and performance records of the equipment they use.

The daily cleaning, adjustment and care of equipment is very important. The best arrangement is to have a mechanic do this work, assisted by the operator. This prevents, to a large extent, overlooking some matters that need attention, although they may not have given any trouble. The schedules of the two pick-up sweepers in Durham are arranged to keep the equipment busy for the time assigned. Each operator is furnished with a small city map on which is shown each day's schedule in separate colors. They also have typewritten lists of the streets scheduled for each day, together with the sweeping length of each street. The schedule is so arranged as to produce the maximum amount of sweeping mileage with as little mileage traveled without sweeping as possible. Mileage traveled without sweeping is referred to as "dead mileage" and no credit is given to the operator for it. The mapped schedule enables the operator to easily arrange his sweeping so as to eliminate all possible dead mileage.

Steps Toward Economy

To accomplish the reduction of street-cleaning costs in Durham, several changes have been made during the last two years. These changes have properly been gradual. It was found that the helper on each sweeper was not necessary. Supplies were bought in larger quantity and their costs thereby reduced. The operation of flushers in conjunction with sweepers was discontinued. The sidewalks in the business section had been swept at night. This was discontinued and the white wings were required to take care of this work along with their other duties during the day. Instead of the usual pushcart, the white wings were equipped with a sack arrangement hung from the shoulder which enabled them to get about faster and cover more territory. The few rough rock gutter streets were cleaned regularly each Saturday morning by a crew of men, but these streets are now patrolled by the white wings and an extra crew is seldom needed.

The sweeping schedules have been revised until all possible dead mileage has been eliminated. The last change made because of reduced budgets was the adoption of the 45-hour week. This has proved an ideal arrangement with two sweepers being operated, since it affords ample opportunity to keep the equipment in tip-top shape. The night sweeper operates from 1 a.m. until 10:30 a.m., with a half-hour for breakfast, on Mondays, Wednesdays and Saturdays. On Tuesdays, Thursdays, Fridays and Sundays, this sweeper operates for 4½ hours, beginning at 1 a.m. The other sweeper begins at 7:30 a.m. and stops at noon on Wednesdays and Saturdays, but operates until 5 p.m. on other week-days, with 30 minutes for lunch. The sweepers dump at the nearest of many places provided, when the bins are filled. The sweepings are collected by a truck and hauled to fills.

The report for the fiscal year April, 1931, to March, 1932, shows an expenditure of $457.68 for gas, oil, grease and water; $740.32 for brooms; and $894.53 for supplies, repairs and labor. The cost for the operator was $1,184.43. A total of 6,725.7 curb miles was cleaned, at an average cost per mile of 48.7 cents.

ACKNOWLEDGMENT.—From a paper presented before the International Association of Public Works Officials.

Springfield, Mass., Uses Zoning as a Basis for Assessment

By JOSEPH TALMAGE WOODRUFF*
Consultant

BALANCE is as necessary in zoning as in all other things. A zoning plan that provides business area for a million people in a city that probably will not have more than 200,000 in fifty years is poorly constructed. The zoning plan should be not only balanced in itself but coordinated with all other city functions.

After zoning has assigned definite uses to definite areas, it automatically implies certain differences in value. Zoned residential areas take on certain values as existing and potential residential sections. Business areas and industrial areas take on values suitable to existing and proposed business and industrial sections. Property zoned for residence use should be assessed as residence property; and likewise with business and industrial uses.

All this seems obvious, yet a check-up of zoned cities shows that in few cases is zoning used as a basis for assessment.

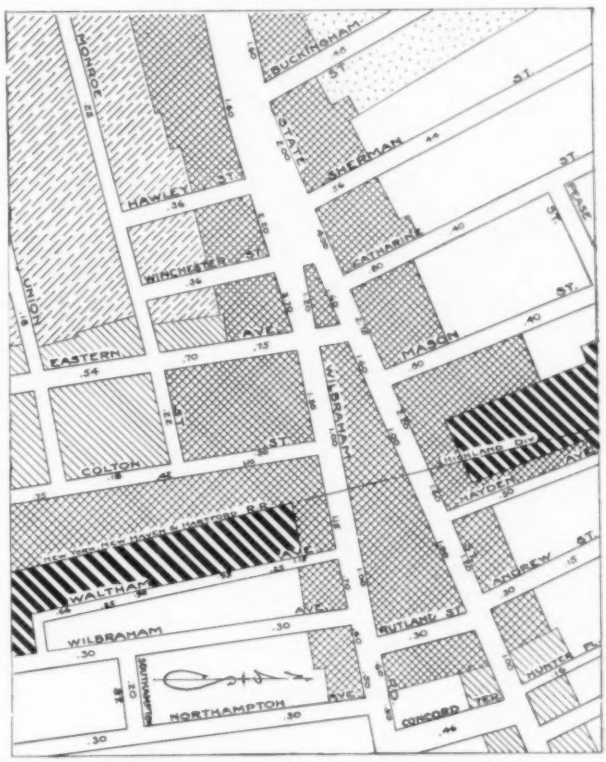
A man who is asked to pay taxes on a piece of property assessed on the basis of business property and zoned for residence use certainly has a grievance which he usually expresses by asking for a zone change. Recurrence of these requests upsets public confidence and destroys the protective value of zoning.

Ten years ago Springfield made a city plan and a zoning plan and began a reassessment of the city along scientific lines. The Board of Assessors established graduated street values which were based on their judgment plus the advice of a picked committee of realtors and with zoning as a base. These values represent dollars per square foot. They applied to every lot along both sides of a street and changed as they passed from one zone to another. An 80-cent street figure for business became a 40-cent street figure where the residence zone began. (See accompanying drawing showing portion of the assessors' street value map.)

Special cases arose, as they do in all problems. The large triangular property in the center of the illustration was zoned into business, but is completely covered by a non-conforming heavy industry. It could not be valued at retail or wholesale business prices and so was assessed according to its non-conforming use. All non-conforming uses carry assessed values according to their actual use until they revert to conforming uses. Different sizes and shapes of lot require different treatment. Corner lots must be separately considered. Every lot has its factor which expresses its variation from the normal. The factors are permanently characteristic of each lot and are computed from formulae worked out for Springfield conditions. Normal lots have a square-foot factor of one.

Let us suppose a man owns a peculiarly shaped lot having an area of 10,000 square feet. The lot is not worth what it would bring if it were uniform. It carries a correction factor of .7, which is set by formulae covering the specific type of peculiarity. The lot factor will be 10,000 x .7, or 7,000. If the street value this year is $1 per square foot, the lot will be assessed for $7,000. If next year the street value is $1.25 per square foot, the lot will be assessed for $7,000 x $1.25, or 8,750. All lots on the same location and the same street in the same year are assessed by the same street value multiplied by the exact square feet in the lot if it is a standard shape, or by a square footage adjusted to peculiarities if it is not standard.

Exact information is of course indispensable in an assessment job. The Springfield Board of Assessors realized this and have employed an engineer since they first began to set up the system. The Springfield method is scientifically applied common sense, fair to every one and—as would be expected—it works.



PORTION OF ASSESSORS' MAP, SPRINGFIELD

Numbers in streets are dollars per square foot. Dotted areas are zoned for one-family houses; plain areas are zoned for one- and two-family houses; dashes indicate apartment zone; light hatching indicates retail business zone; cross-hatching, wholesale business zone; and heavy-hatching, industrial zone

* Mr. Woodruff is Planning Engineer of the Fairfield County Planning Association, Bridgeport, Conn.

Essential Public Services Must Go On

SENATOR DAVID I. WALSH, speaking to New England School Superintendents at the State House in Boston, as reported by the Boston News Bureau, declared that, despite programs of economy, all governments, local, state and Federal, must provide for public health, education and protection of life and property. In applying the yardstick of economy, the first step is to differentiate between essentials and non-essentials. In caring for the poor and needy, he declared, there should first be individual action, and when this is not sufficient, the problem ought to fall on local government, and when too burdensome there, on the state. If the state's credit becomes impaired, the burden should be put on the Federal Government.

"We owe it to our country," said Senator Walsh, "that there should be no impairment of the facilities which will bring service to the next generation."

Business Seeks Protection by Municipal Government

THE economic depression has dumped on the doorstep of many a city and village administration another new problem for local legislative bodies to wrestle with. Various groups of citizens are demanding that common councils and boards of trustees pass local laws which will protect them from what they claim is unfair competition, or which will prevent price cutting. This has resulted in a flood of enquiries received by the Bureau of Information of the New York State Conference of Mayors.

Only a short time ago business leaders were demanding that government adopt a hands-off policy. Business now is apparently reversing its position so far as local government is concerned. Instead of complaining about government regulation and calling attention to the added cost it imposes on the taxpayer, numerous business groups are now demanding more protection in the form of regulation.

Merchants in municipalities are demanding that local laws be passed regulating auctions, auctioneers, solicitors, hucksters, and transient retail merchants. The solution of this problem is comparatively easy, except when the local merchants object to the regulations being enforced against local residents. Many want the regulations and licenses to apply only to outsiders. This, the New York State law says, cannot be done. They also want to regulate those engaged in interstate commerce, but here again the municipality lacks power, for the courts have held that the Federal Constitution prohibits localities from interfering with interstate commerce.

One group of municipalities is wrestling with the taxicab fare problem. So many unemployed men have gone into the taxicab business in these places that competition has become very keen and fares have been cut to the bone. The older taxicab companies and individual hackmen claim that the low prices are ruinous. Many are demanding that local legislative bodies fix a minimum fare. Many municipalities have prescribed a maximum fare, but to date only one in the state has tried to prevent rate cutting by fixing a minimum.

Coal dealers are trying to stop what they claim is unfair competition in several cities by having local laws which require that all coal merchants be licensed. Albany passed such an ordinance, which levied a high license fee. The courts have just declared this local law illegal. The administrations of several cities which were requested by coal merchants to pass similar ordinances, and have been awaiting the decision in the Albany case, will probably not take any action. Awning dealers in some cities are seeking local license laws similar to that proposed by the coal merchants.

Milk producers and dealers are suggesting that ordinances be passed by cities prohibiting the sale of milk unless it is produced within a specified radius of the city. A few cities are attempting to do this in an effort to reduce the cost of milk inspection. Some cities have been asked by dealers to fix by ordinance a minimum price for milk. Several municipalities are being importuned to license all dealers.

Dry cleaners are demanding that the business of dry cleaning and the rates charged be regulated by ordinance. Many cities regulate the establishment and operation of dry-cleaning plants on the ground of public safety.

For many years municipalities have had the power to license and regulate businesses and occupations for the safety, health, comfort and general welfare of the inhabitants, and most of them have exercised that power in one way or another. Licensing and regulating businesses to prevent competition or price cutting is a field which municipalities have not explored to any great extent. Where it has been attempted, any objections have usually been sustained by the courts. Municipal power to regulate for this purpose has never been specifically granted. However, the courts have held that the police power may be implied where it appears necessary. Then, too, the courts have repeatedly held that a distinction must be made between a license granted in the exercise of the police power and one granted in the exercise of the power of taxation.

W. P. CAPES,
Executive Secretary, New York State Conference of Mayors and Other Municipal Officials.

Use Gas Tax for Roads Only

PRINTED in red, white and blue and carrying the timely message, "Use Gas Tax for Roads Only," windshield stickers are beginning to be seen in large numbers on the highways of various states. They are being distributed by the Marion County, Ind., Motor Club, the Chicago Motor Club, the Illinois Construction Council, and organizations in Rhode Island and other New England states. They were seen everywhere at the Highway and Building Congress in Detroit in January and constitute a very effective means of combating the organized transportation group which is trying to defeat highway construction by systematic diversion from the gasoline highway tax.

The plan to distribute these stickers was undertaken at the urgent request of state and county highway departments and, according to the Ohio Good Roads Federation, some 24 industries have shown their direct interest. Highway funds, it is pointed out, were intended for the construction, maintenance, and improvement of the country's streets and highways, and provide a solution to the unemployment problem, since 90 cents out of every dollar is eventually returned to labor.

These stickers, one of which is reproduced here, are 6½ inches wide by 3½ inches high. They are being produced by the Ray Press, 633 Plymouth Court, Chicago, and are offered to organizations interested in distributing them, at prices ranging from $2.50 per 1,000 in 100,000 to 150,000 lots, up to $3.50 per 1,000 in 10,000 to 50,000 lots.

On the reverse of the stickers, where it can be read by anybody riding in the car, appears the following:

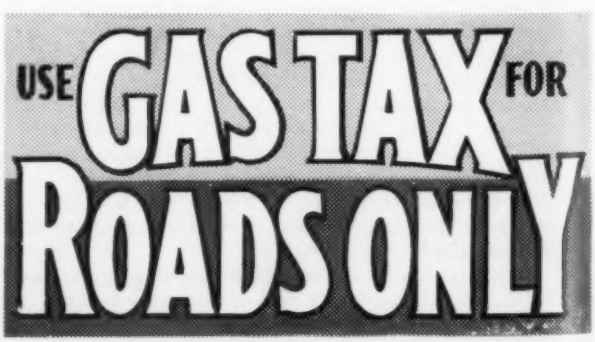
Motor taxes were created to pay for the roads and streets on which you drive your car—and for that purpose ONLY. Your mileage costs are LESS when you drive on improved highways. THIS PAYS YOUR MOTOR TAX as long as the road money is spent for improving the highways, the main city streets and county roads.

Now it is proposed to divert this money from job-giving road work to other purposes—to general public expenses which EVERYBODY should help to pay.

Motor taxes become CLASS taxes when they are used for other than the improvement of the motorists' roadway. Misuse of highway funds will add thousands to the unemployed ranks. YOU will get less benefit for your motor taxes and so will the working man.

Let your Public Officials know you want ALL of the GAS TAX and LICENSE FEE MONEY spent for improving highways—AND NOTHING ELSE!

BOTH THE WORKING MAN AND THE MOTORIST WILL BENEFIT



FORWARD STEPS

Reported by
Municipal Officials, Chamber of Commerce Executives, and Others

Berkeley's Unified and Varied Recreation Program

BERKELEY, CALIF.—All the activities in Berkeley's extensive recreation program cost each of the 21,000 taxpayers an average of only 1½ cents a day. Compared with $1.30, the cost of keeping a delinquent boy in a correctional institution for a day, recreation proves to be decidedly worth while, particularly in view of the fact that the city's crime curve has not increased, as might be expected in a period of depression and unemployment.

The low cost of recreation is made possible in a large part by centralization of administration, which also permits a unified program. All recreation activities in the city are centered in the Recreation Department. The Superintendent of Recreation has charge of physical education in the schools, after-school playground activities and the use of school buildings by adults for evening games, as well as the operation of three municipal camps and supervision of the city's park system of 114 acres.

The Superintendent is employed on a half-time basis by the Board of Education as Director of Physical Education, and half-time by the city as Superintendent of Recreation. The recreation budget for the fiscal year 1931-1932, as allotted by the city, was $82,111.51. The Board of Education expended $25,879.40, bringing the total cost for the year 1931-1932 to $107,990.91. Assuming 83,000 as the approximate population (the 1930 figure was 82,109), the per capita cost of all recreation activities in Berkeley was only $1.30.

The variety of recreation activities and facilities offered by the city includes eighteen playgrounds open the year round, and seven others open only during the school year, with a total (estimated) attendance of 1,206,428. A regular summer playground program provides for baseball contests, horseshoes, checker tournaments, swimming, twilight league baseball for industrial and manufacturing groups, tennis tournaments, croquet, miniature golf and play day for girls. The city has two indoor swimming pools and eighteen tennis courts, some of which are lighted at night. The Recreation Department has been active in promoting the live Christmas tree idea and has also organized a riding club, a hiking club and a municipal band. The park program includes the planting and care of shrubs in parking areas, the beautification of many vacant lots, and the supervision of all parks.

The three municipal summer camps are of the family variety, with trained recreation leaders in charge. One is in the Redwoods, one in the Yosemite country, and the third in the High Sierras near Lake Tahoe. They are self-sustaining, non-profit units, and offer ideal camping conditions at minimum rates.

CHARLES W. DAVIS,
Superintendent of Recreation.

ONE OF THE BERKELEY CAMPS
The Cazadero Redwood Camp, situated among age-old redwoods on Austin Creek, Sonoma County, Calif.

"SHOOTING THE CHUTES"
Berkeley Tuolumne Camp, in the Stanislaus National Forest, elevation 3,500 feet, near Yosemite Park

The Tulsa Chamber Organizes Constructive Work for Government Economy

TULSA, OKLA.—Encouraged by its success in coordinating various forces which during 1932 brought about adjustments which will save Tulsa taxpayers over a million and a quarter dollars annually, the Tulsa Chamber of Commerce began some weeks ago to see ways by which it could broaden its usefulness to include distinct services to the taxpayers of the entire state.

At least twenty state organizations were framing programs of proposed legislation to be introduced in the State Legislature early in 1933, designed not only to obtain certain ends sought by the various organizations, but containing items which, if passed by the Legislature, would so change state laws as to make possible great savings in governmental expenditures. The Tulsa Chamber of Commerce carefully compiled the items contained in all of these programs which centered on common suggestions for governmental simplification and tax reduction, and came to the conclusion that only through a serious council or representatives of the various organizations offering legislative programs could anything like concerted effort be brought to bear on the several items which each of the programs carried in one form or another. The Board of Directors of the Chamber of Commerce authorized the organization of such a conference and requested several important state organizations to join in a call for the meeting to be held at the Tulsa Chamber of Commerce on December 9 and 10, 1932. No less than twenty-three state-wide organizations sent their officers and members of their legislative committees to the meeting.

The report of the resolutions committee, which studied the various reports of the participating organizations, presented a legislative program that covered proposals concerning which there was no controversy among the organizations. This program was the major action, and unanimously adopted. All organizations participating pledged themselves to a united effort in the presentation of the program adopted. It was made plain that the action of the conference did not preclude any of the organizations from continuing their individual efforts for securing legislation of special interest to individual groups, as the program adopted was general in its scope and of interest to every taxpayer regardless of special interests.

The conference placed the program in the hands of all the state legislators, the Governor's budget committee and others, and is now engineering the follow-up program so as to assure continuous and

concerted effort until all the items have been reduced to specific bills, and have received consideration by the State Legislature. The twenty-three organizations participating in the conference have a combined influence which reaches into every corner of the state, and the favorable response from legislators has been state-wide.

One characteristic of the program, unanimously endorsed by the full conference, was friendliness toward the efforts of Governor Murray in the same general direction, through his unofficial budget committee, as outlined by Major Eugene M. Kerr in an address to the conference. Major Kerr, a member of the Governor's committee, stated that his committee has many suggestions in mind which coincide with the approved program of the conference.

The program recommended, among other items, consolidation of essential state boards, bureaus, institutions and departments; and elimination of others; a just system of fees for students in state educational institutions; central purchasing for county and state institutions and departments; the economical and efficient consolidation of county offices; and, of especial importance, the following: That proper legislation be had giving to the counties options for adoption of county government covering the following:

1. Modified county unit system of education.

2. County home rule or charter system of government .

3. Consolidation of county and county-seat municipalities.

Park, Playground and Public School Replace Baltimore's "Lung Block"

BALTIMORE, MD.—With the completion of a combined public park and school playground adjoining the Samuel Coleridge Taylor School for colored children, the Public Improvement Commission has accomplished what it believes to be one of its most constructive pieces of work. Ten years ago, the area now occupied by the park-playground, the school and its annex consisted of squalid, dilapidated buildings which had been a blot on the city's health map for many years. It was known as the "Lung Block" because of its high tuberculosis rate.

In 1923 the Commission decided to acquire part of this property for use as a school site, as the first step in the development program just finished. Buildings were razed, and in 1926 Public School No. 122 was erected with just enough land to accommodate it. Lack of funds made any further improvement impossible at the time. Later on, the increasing school enrolment required an addition, which was built in 1931. Finally, through the cooperation of the Board of Estimates, the Park Board and the Public Improvement Commission, land for a combined public park and school playground of about 2½ acres was acquired. The first two boards contributed $50,000 each, and the Commission $100,000.

The completion of the project in 1932, as shown in the accompanying photograph, not only has eliminated the health menace, but will undoubtedly result in the improvement of the adjoining property. Incidentally, in place of the narrow street on which the school was built, a wide street has been made. The total cost of the whole development was over $800,000.

RALPH C. SHARRETTS,
Secretary, Public Improvement Commission.

SAMUEL COLERIDGE TAYLOR SCHOOL, BALTIMORE
On the site of the shanties of "Lung Block"

More Ashes and Cinders Help Transform City Dump into Golf Course in Winter

CHICAGO, ILL. — Golf-course greens have been built successfully from ashes and cinders during wintry weather. The Mid-City, a private course in Chicago, has done this, with the aid of city refuse.

The land for the proposed golf course site grew from service as a city dump into deep deposits of ashes, cinders and rubbish. The problem of getting material suitable for building the greens puzzled the builders. More ashes and cinders on top of what already existed could not be a very serious experiment, they reasoned, and would be more economical than the usual construction method of balancing cut and fill. The city agreed to furnish ashes and cinders without charge, because of the saving made on long hauling costs and dumping fees that had to be paid at the regu-

BALTIMORE'S "LUNG BLOCK" IN 1930

WITHIN THE BLOCK

lar dumps. Materials were hauled during the winter when the frozen surface supported the weight of tractors and trailers, thus permitting dumping in place. As much as 1,000 cubic yards of this material were used on a green.

Shaping of contoured green surfaces followed with the aid of a Caterpillar tractor and blade. Fairway bunker hazards were similarly built.

Precautions were taken to keep ice, snow and frozen lumps out of the ash-cinder fill, otherwise settling when these melted down would result in warping the green surfaces. Men picked over the material as dumped to remove tin cans and other rubbish. A veneer of sandy fill and then top soil, each to a depth of four or five inches, completed the green construction.

Ingenuity displayed in minimizing green building costs through the use of ash-cinder fill for the base resulted in other advantages. Drainage conditions proved very favorable to the growth of creeping bent grass, and play conditions were good shortly after a rainfall or artificial watering. Surfaces had enough "give" so that rolling did effective "ironing out" to give excellent putting conditions. Earth worms just didn't seem at home in the strange ash mixture, and their elimination was alone considered a worthwhile saving.

FRANCIS J. KELLEHER.

A GOLF COURSE BUILT ON CITY REFUSE

Above, ashes and cinders being distributed by a tractor. Below, a putting-green on the Mid-City course, Chicago, with cinder and ash base, two weeks after sodding

Town and County Planning Brings Big Benefits

FOR consideration at a citizens' meeting last month in a New Jersey community where the need for a planning board was under discussion, two consultants were asked to submit brief statements of the results already evident from recent planning activities in the town of Montclair and Mercer County respectively. These statements, which follow, are especially significant as indicating the importance of planning at a time when so much thought is being given to public economies.

IN MONTCLAIR, N. J.

By HAROLD M. LEWIS, New York

The Montclair Town Planning Board was established under a town ordinance adopted July 2, 1930, and a technical staff was set up in April, 1931. Reports on which a master plan can be based have been completed. Direct results have been obtained in connection with the approval of about six subdivision plans, in each case improved layouts suggested by the Planning Board being gladly adopted by the subdividers. In one case a considerable portion of the subdivided area was offered for dedication for a public park. Subdivision regulations were drawn up and adopted by the Board in July, 1932.

Through conferences with the Essex County Park Commission this Commission has adopted plans for a promenade on the northern part of Eagle Rock Reservation and has been constructing it with unemployed labor. Plans for Brookdale County Park were changed to provide Montclair with direct roadway access. Grading for this is complete.

A comprehensive plan has been made for dealing with the Erie Railroad crossings in Montclair, which in the past have been only isolated single projects. Other completed studies related to a general plan, detailed studies of certain street projects, parks and playgrounds, business and apartment zones, architectural control, land values, and a method of carrying out the master plan. It has been pointed out that a large part of urgent needs can be met without direct expenditure by the town, but through legislation and the offering of constructive suggestions for state, county or utility projects.

IN MERCER COUNTY, N. J.

By RUSSELL VAN NEST BLACK, Princeton, N. J.

We have much the same sort of illustration in connection with our recently completed plan for Mercer County. The county was recently compelled to widen a suburban highway to the very modest width of 59 feet. Damage to property alone on about one-half mile of this widening project cost in excess of $50,000. Building lines established in accordance with a county plan a few years ago would have obviated most of this cost. In strong contrast, the county undertook to build one of the planned highways through open country, adjacent to and simultaneously with the above project, obtaining a mile and a half of new 80-foot right-of-way at a cost of about $2,000 per mile.

In the same county a bridge was built four or five years ago at a cost of perhaps $25,000. The county plan indicated that this bridge was misplaced by a few hundred yards and must eventually be duplicated, illustrating the waste occasioned by misplaced public works due to lack of the wider and longer view occasioned by a comprehensive plan.

A few weeks ago a subdivider came to the county office with a plat falling directly in the path of an important planned county highway, without showing any provision whatsoever for such a highway. By restudy of this plat we were able to show the subdivider that a rearrangement of the street layout providing for the county thoroughfare would give him more and better lots and in other ways work out to his advantage. Absence of a plan in this instance would have meant crystallization of this piece of property in a form that would have blocked the thoroughfare or added many thousands of dollars to its cost.

Incidentally, Mercer County has been able to utilize its plan to large advantage in connection with selection of unemployment relief projects. More than nine miles of new planned highways have been graded and partially improved by relief labor. Naturally, this was not done with maximum efficiency, but, by having a plan to indicate a logical direction for relief projects, this county now has something real to show for money expended instead of a few manicured ditches and woodlots.

Many planning possibilities have not yet been realized in New Jersey, so far as I have observed. Certain advantages of a comprehensive park and parkway plan have not yet been put into operation. In Akron, Ohio, where I was connected for a time, our planning department succeeded in getting over 100 acres of park land and several miles of parkway, by free dedication, incidental to land subdivision control.

IN EVERY PARK IN NEW YORK CITY EMERGENCY WORKERS ARE CONVERTING BARREN SPOTS SUCH AS THOSE SHOWN ON THE LEFT INTO BITS OF BEAUTY

In Queens alone 300 acres of waste land have been cleared and graded for new parks

A $20,000,000 Investment in Emergency Work Jobs

TO answer many questions about the emergency work on which New York City spent $20,000,000 last year and employed 36,000 heads of families, Louis Resnick recently made a three-day tour of the jobs and tells about it in the January number of *Better Times*, of which he is Editor, being Director of the Public Information and Education Department of The Welfare Council of New York City.

The Emergency Work and Relief Administration occupies a building at 23d Street and Second Avenue, given rent-free by Jeremiah Milbank for this purpose. The entire staff of 400 men and women are themselves emergency workers—accountants, architects, bank cashiers, employment managers, sales directors, receptionists, interviewers, clerks, supervisors, auditors, stenographers; many of them formerly holding positions of distinction and special and technical responsibility. The guides en route to the jobs were formerly construction engineers, five-and-ten-thousand-dollar-a-year men; now one of them is directing 2,400 emergency workers in the 70 parks of Manhattan; the other is director of field supervision in the City Work Bureau, overseeing the work of 36,000 men scattered over the 300 square miles of the five boroughs of the city.

Twenty-five jobs were visited. In Fort Washington Park four stone masons and 36 button-hole makers, pants pressers, pushcart peddlers and a few common laborers were building a stone wall, a terraced walk, and a replica of the fort of 100 years ago; and they were producing fine masonry. In Inwood Park a gang of ex-storekeepers, cloakmakers, shipping clerks, taxi-drivers and a few building tradesmen are installing storm drains, cinder paths and retaining walls. "Most of these boys never did a day's work of this kind in their lives before they came here," says the civil engineer in charge of the men. "Many haven't been eating regularly for so long they haven't the strength to do a good day's work the first week or two. I let that kind take it easy at first; after a while they're as good at ditch digging or at pushing rock as any laborer a contractor hires for such work. . . . I don't drive them, but I think we're getting close to 80 per cent efficiency out of these men; in comparison with some jobs I've seen, we're giving the city a dollar's worth of work for every work relief dollar."

At Seaman Avenue and 214th Street several gangs are grading, curbing and paving a steep and winding street. They have a steam roller rescued from a junk heap, and no other road-making equipment excepting picks and shovels, "but," says Mr. Resnick, "they are managing to convert a bit of waste land into an attractive street," under a graduate engineer, long unemployed, now acting as foreman. By man-to-man talks and by transferring a few men, he has eliminated loafing, and he is also concerning himself with the future of the men and their families. Some of the workers come day after day with no lunch, and when the rest pass food around, there is not enough for all. Some of them are sick, some desperate because of home relations, and the foreman listens and advises.

A former professor of comparative religion is in charge of a hundred emergency workers building retaining walls and walks in Van Cortlandt Park. A year ago—and for three months—he was a laborer—$5 a day, three days a week, in this same gang. He has been rehabilitated from a destitute, under-

SCORES OF BLOTCHES ON THE LANDSCAPE OF OUTLYING BOROUGHS HAVE BEEN CONVERTED INTO CORNER GARDEN PLOTS AND WAITING STATIONS FOR BUS RIDERS

A FIELD OF STONE CONVERTED INTO TWENTY TENNIS COURTS BY CITY EMERGENCY WORKERS

weight, white-collar man on the verge of a breakdown, into "the toughest foreman in the Manhattan parks"—physically hard, mentally stable, getting immense satisfaction out of his work. At another place there is a rabbi who has become an expert stone mason. And at Fordham Hospital there are 250 emergency workers well amalgamated with the other employees.

Hundreds of "before and after" photographs at administration headquarters show the results of this emergency work—long needed, often badly needed. Some of the projects completed are:

In the Bronx parks, emergency workers built 1,400 wood and concrete benches; built 17,000 feet of concrete and masonry walls; built 5,300 feet of pipe rail fence with concrete posts; laid 260,000 square feet of concrete and cinder walks.

In Queens, emergency workers have constructed or resurfaced 35,000,000 square feet of road; drained 437,000 feet of ditches.

In the Bronx Borough President's Office, emergency workers have resurfaced 230,000 square yards of streets; removed 34 buildings for widening of streets; renovated, painted and repaired all public buildings in the jurisdiction of the borough president.

In four boroughs outside of Manhattan, emergency workers have cleaned 1,300,000 feet of old ditches; dug 146,000 feet of new ditches; 25 men were kept busy for weeks cutting poison ivy.

In Richmond the old Court House was completely rebuilt.

In Jacob Riis Park a half-mile of concrete bulkhead was built and 85,000 square feet of concrete walks laid. In other Queens parks 4,000 new benches were built, 4,000 old benches were repaired, 200 baseball diamonds were laid out, 300 acres of ground cleared and graded for new parks, 1,500 cords of wood were split and delivered to needy families, and all buildings in the Queens park system were repainted.

In the Police Department 500 tons of coal per day are being received and distributed by emergency workers. In the Department of Plants and Structures 33 miles of roadway on bridges and viaducts have been repaired. In the Docks Department a two-story warehouse has been built with salvaged material, piers have been repaired and watchmen have been assigned to all unleased piers; on two recent occasions emergency work watchmen have saved persons from drowning.

Discouraging the Criminal

METHODS of preventing crime formed the subject-matter of a recent radio talk in the series presented by the New York State Conference of Mayors and Other Municipal Officials. This topic was discussed by Captain-Inspector Albert B. Moore, Director of the New York State Police School, Troy, N. Y., as interviewed by William P. Capes, Executive Secretary of the Mayors' Conference. Crime prevention as here treated is used in the broad sense of discouraging or thwarting the criminal rather than in the more restricted, though perhaps more fundamental, meaning of social work to combat influence tending to make criminals of juveniles.

The necessity of cooperation between the police and the citizens was stressed by Captain Moore, and the latter was urged to note unusual or suspicious conditions and report such matters to the police. To assist in furthering cooperation he suggested that there be an officer or a bureau of public relations within each police department with the function of making contact with civically minded clubs, public organizations, etc., and to give talks and explanations of general and special crime conditions including information on *modus operandi* or specific methods of criminals. He emphasized that information regarding criminal activities must be spread throughout large areas in this day of rapid transportation and that it should be passed on by police departments to merchants, hotels, banks, or other possible victims of the criminal. In New York State an elaborate system of police teletypewriters, connected with similar systems in five surrounding states, constitutes a valuable means of transmitting such information to police departments.

Captain Moore also commented upon the carelessness of property owners, and even of merchants, because of which it becomes relatively easy for larceny and even burglary to occur. Greater care on the part of the citizen would remove much temptation; similarly, precautions placed upon the transportation of payrolls prevent many holdups. The use of prowl cars, each manned by two policemen and operating on irregular schedules, was particularly commended. Captain Moore said, "In former times, the foot patrolman walked his beat on a schedule. His principal duty was ringing police boxes so that headquarters could be notified that he was still patrolling his beat. It generally happened that the police boxes on any one beat were so widely scattered that the policeman barely had time to ring all of these boxes on the given hours. Because of that condition, patrolling a beat was nothing more or less than ringing boxes on time without giving attention to the required observations of premises, etc., to ascertain if crimes were about to be committed therein. Again, we find that escape from the scene of crimes is usually by means of fast automobiles, and it must necessarily follow that the pursuing agency must be as well equipped. I believe that criminals will hesitate to operate in any section where there is a good chance of their apprehension."

He stated in conclusion: "People are just beginning to realize what crime actually costs and, after all, governmental agencies will give the public exactly what the public demands. The public has been slow in grasping the idea of crime prevention. There has been too much interference with the work of police organizations—politically and otherwise. The enthusiasm of the public for their police departments, coupled with a desire to keep them free and clear from all outside influence in the righteous performance of their duties, will naturally bring about crime prevention."

Fire Department Strength

AN inquiry into the present practice of 236 municipalities regarding fire-department strength, particularly as to the relations of stations and apparatus to area and population, and of personnel to apparatus, has recently been made under the auspices of the New York State Conference of Mayors and Other Municipal Officials, and reported in its Publication No. 18, entitled "Organization and Administration of a Municipal Fire Department."

In the Foreword it is stated:

"Although every municipality is provided with some sort of fire-fighting facilities, relatively little is known about what the requirements for effective fire work actually are. How many fire stations should there be in a square mile of territory? How many men should be assigned to various pieces of apparatus? What kinds and types of apparatus should be employed in the municipality as a whole or in any given district? These and a hundred kindred questions constantly confront the conscientious fire administrator, particularly in periods when economies are being urged by groups who are in many cases uninformed.

"It is at once obvious that no definite rules and standards can be laid down which will automatically apply to all municipalities. Differences in topography, climate, nature of construction, character of population, congestion and other variable factors have an effect on the fire problem which calls for different remedies in each municipality. However, the Mayors' Conference felt that approximate standards for the organization and administration of a municipal fire department could be formulated which would be valuable in checking existing or proposed organization, keeping constantly in mind the variable factors cited above. Accordingly, the Bureau of Training and Research engaged Chief Joseph N. Sullivan, head of the Utica Fire Department and former President of the International Association of Fire Chiefs, to make a study of this subject and attempt to indicate the desired standards.

"In the course of his study, Chief Sullivan, desiring a composite picture of the average fire department, sent a questionnaire to a number of cities in the United States and obtained answers from 236 municipalities, ranging in population from 4,600 to 7,000,000, situated in 39 states and representing every section of the country."

The report has the following to say about personnel in relation to apparatus:

Equipment and Manning

"The National Board of Fire Underwriters has established from years of loss experience a schedule for grading fire defenses covering the number and distribution of fire companies, their manual strength, and equipment and methods used. This schedule also covers water supply, fire-alarm systems, fire protection and prevention laws, existing fire hazards and building construction requirements.

"Although it is believed that there are but few municipal fire departments meeting the National Board requirements in full, it is true that strict adherence to the schedule as prescribed would mean better fire protection and a lower fire loss.

"Under the National Board schedule one of the regulations for man power of companies calls for two additional men for each company for night service. The lack of lights at night slows up the operation at fires and is one of the reasons that the National Board advocates more men for night duty.

"Of recent years some fire departments have been equipped with portable lighting equipment to overcome in a measure the handicap of darkness. When this equipment is used, increased efficiency is noted; the men work with more confidence and get quicker and better results. In this study a query was made concerning the use of light wagons, and twenty-five enterprising fire departments throughout the country reported the installation of this modern improvement, which tends to give the fireman a better chance to conquer the ravages of fire.

"Adequate equipment cannot be efficiently used unless adequate man power is furnished. The manning of companies of various departments shows a wide difference in size of personnel. The man power to operate pumper and triple combinations was given as follows:

13 cities have one officer and seven men.
27 cities have one officer and six men.
26 cities have one officer and five men.
67 cities have one officer and four men.
32 cities have one officer and three men.
9 cities have one officer and two men.

"Truck companies are operated by the following personnel:

1 city has one officer and nine men.
4 cities have one officer and eight men.
18 cities have one officer and seven men.
24 cities have one officer and six men.
38 cities have one officer and five men.
56 cities have one officer and four men.
20 cities have one officer and three men.
10 cities have one officer and two men.

"It should be pointed out that the figures given above represent one platoon, or half of the company strength, and are from cities having full paid departments.

"Enough apparatus to control the average fire must respond to all alarms, and this survey of 236 municipalities shows that the general average of response in a high-value district is three pumper companies, two truck companies and one rescue or salvage company. In the manufacturing district the same coverage was apparent and in the residential district the average response was two pumper companies and one truck company."

It was found that 122 of the 236 municipalities reporting conduct training schools for firemen, and of these, 99 also are provided with drill towers. There were eight cities with drill towers but no training school. It is stated that a completely equipped drill tower, with all the modern devices, costs from $5,000 to $12,000, according to the construction.

The report gives itemized information for each of the cities, arranged in population groups:

1—Over 200,000
2—100,000 to 200,000
3—50,000 to 100,000
4—25,000 to 50,000
5—Under 25,000

This is summarized as follows:

SUMMARY

Group	Cities	Stations	Apparatus	Officers	Men	Civilians	Fire Prevention	Drill Towers	School
1.....	33	1,530	2,471	4,819	23,744	849	31	25	30
2.....	41	522	907	1,623	5,995	319	29	26	25
3.....	66	440	778	1,229	4,848	226	35	31	40
4.....	51	237	426	656	2,197	112	16	24	27
5.....	45	117	234	...	494 Pd. 449 Call 7,768 Vol.	...	3	1	1

AVERAGES

Group	Man Power, Each Platoon Engine	 Truck	Protection Per Square Mile People	 Stations	 Apparatus	 Firemen
1.....	1 Off., 5⅔ Men	1 Off., 6 Men	8,808	⅔	1	10.7
2.....	1 Off., 4½ Men	1 Off., 5 Men	4,788	1	1	9.
3.....	1 Off., 4 Men	1 Off., 4 Men	5,594	½	1	8.
4.....	1 Off., 4 Men	1 Off., 4 Men	3,856	½	1	5.
5.....	1 Off., 3 Men	1 Off., 3 Men	3,032	½	1	4.

The Municipal Bond Market

THE following is a representative list of recent sales of new issues of local bonds, taken from current numbers of *The Bond Buyer*:

Amount		Rate (%)	Term (Years)	Basis (%)
$ 100,000	Rome, N. Y.	3	1-4 ser.	2.83
3,000,000	Buffalo, N. Y.	3.10	3 2/3 avg.	3.08
500,000	Alameda County, Calif.	3¼	3 5/6 avg.	3.24
300,000	Minneapolis, Minn.	3½	1-5 ser.	3.48
500,000	Northampton County, Pa.	3¾	14¼ avg.	3.67
4,040,000	Syracuse, N. Y.	3.40	6.4 avg.	3.396
2,160,000	San Francisco, Calif.	4.12 avg.	9.1 avg.	4.06
265,000	Lawrence, N. Y.	4¼	16 avg.	4.24
605,000	Trenton, N. J.	4.47 avg.	11.2 avg.	4.41
205,000	Johnstown, Pa.	4½	3 avg.	4.49
2,000,000	Los Angeles, Calif.	4¾	1-40 ser.	4.68
2,331,000	Newark, N. J.	4¾	2-9 ser.	4.70
300,000	Rock Island, Ill.	5	7 1/6 avg.	4.96
249,000	Will Co., Ill.	5	5 5/6 avg.	5.29
300,000	Portland, Ore.	5½	13 5/6 avg.	5.48
530,000	Multnomah Co., Ore.	6	6-15 ser.	6.00

TRAFFIC CONTROL AND FACILITATION

Conducted by Publications Committee, Institute of Traffic Engineers, 175 Fifth Ave., New York

Maxwell Halsey, Chairman, Hawley S. Simpson, Harry H. Hemmings, Arthur G. Straetz, I. S. Shattuck, P. J. Stupka, Donald M. McNeil

Speed as a Cause of Traffic Accidents

THE effect of fast driving as a cause of motor-vehicle accidents is a question about which there is much difference of opinion and few significant data. This uncertainty extends to the effectiveness of official fixed speed limits as a method of regulating speed and decreasing accidents, and also, naturally, to the direction that efforts for accident reduction should take in the immediate future.

With the desire to add to the available body of expert opinion on these matters, from all parts of the United States, and to form a composite of such views, as well as to gather such official statistics as bear on the problem, the Institute of Traffic Engineers sent a request for detailed information and expression of opinion to the motor-vehicle department or corresponding agency in each state. The Institute's questionnaire reads as follows:

Relation Between Highway Speeds and Highway Accidents

I. In your opinion which of the following types of speed regulation is most effective in reducing accidents, next in order, and least effective. (Indicate by the numerals 1, 2 and 3.) (a) Fixed speed limit ; (b) Prima facie rule ; (c) No speed limit (i.e., a reasonable and prudent speed considering the conditions) . What reasons do you advance for your selections? If the fixed speed limit is most effective in your opinion, what speeds do you believe most practicable and enforceable under the below conditions: Rural highway m.p.h.; City residence street m.p.h.; City business street m.p.h.

II. In your opinion do your present state speed laws have any *appreciable* effect in controlling average driving speeds on the open highway? State reason for your answer.

III. Do you believe or know (indicate which) that average rural highway speeds in your state have increased in recent years? If so, how much? Do you believe they will in the near future (a) increase slowly , (b) increase rapidly , or (c) decrease?

IV. Do you believe that high speeds (e.g., in excess of 45 m.p.h.) *alone* are a frequent cause of accidents?

V. Do you believe that high speeds in combination with other actions and conditions are the most frequent cause of accidents? If the answer is "No," where does it rank in order of frequency?

VI. If your state speed laws have been changed in the last three years, did you find any connection between such change and the number of motor-vehicle accidents? If so, describe in detail.

VII. In your opinion, upon which of the following activities would the expenditure of equal amounts of money and effort be most productive of greater safety, next in order, and so on to the least effective. (Indicate order by the numerals 1, 2, 3, 4 and 5.) (a) Education in safe driving practices directed to all drivers in general ; (b) Education in safe driving practices concentrated on the accident-prone and reckless driver ; (c) Eliminating the accident-prone and reckless driver by license suspension and revocation ; (d) Building safer motor vehicles ; (e) Building safer highways .

VIII. If you hold any pronounced views on the relationship between highway speeds and highway accidents not fully covered in these questions, or desire to amplify any of your answers, will you write your comments here or explain further by letter.

Copies of relevant state laws, accident reports, etc., and data on state traffic enforcement personnel and cost were also requested.

Replies were received from 29 of the states, some of them being from highway, police or tax departments, to which they had been referred. These replies have been tabulated as shown herewith.

Additional explanation and comment of considerable interest was given on many of the questionnaires or in letters accompanying them, and is reproduced in part on the next two pages.

RESULTS OF QUESTIONNAIRE ON MOTOR-VEHICLE SPEED AND TRAFFIC ACCIDENTS

STATE	I. Speed Limits (most effective type)						II. Effect (present laws)	III. Average Speeds					Speed as Accident Cause			VI. Change	VII. Activities Preferred					Dept. Replying
	Fixed (a)	Prima Facie (b)	None (c)	Rural	Res.	Bus.		Increased	How Much?	Future Slow (a)	Future Rapid (b)	Future Decr. (c)	IV. Alone	V. In nation	Combi- Rank		Education Gen. (a)	Education Spec. (b)	Revocation (c)	Safer Cars (d)	Safer Roads (e)	
Alabama	2	3	1	..	..	..	No	..	..	Yes	..	..	No	Yes	..	N[1]	3	1	2	4	5	Hwy.
Arizona	3	1	2	..	..	..	No	Yes	30%	Yes			No	Yes		N[1]	1	3	2	5	4	Hwy.
California	2	1	3	45	25	20	Yes	Yes	20+	Yes			Yes	Yes		Yes	5	4	1	3	2	M. V.
Colorado	2	3	1	..	..	..	Yes	Yes	30%	Yes			No	No	3rd	N[2]	1	4	2	5	3	M. V.
Connecticut	..	..	..	..	..	..	Yes	Yes	10+	Yes			Yes	No		N[1]	1	5	2	3	4	M. V.
Delaware	1	2	3	45	25	20		Yes	5-10	Yes			No	Yes			2	3	1	4	5	Hwy.
Florida	2	3	1	..	..	..	No	Yes	20+			Yes	Yes	Yes			2	5	1	4	3	M. V.
Idaho	3	2	1	35	20	15	No	Yes	15	Yes			No	Yes		N[1]	2	3	1	5	4	M. V.
Iowa	3	2	1	..	..	..		Yes	..				No	Yes		Yes	..	..	..	..	..	M. V.
Kansas	2	3	1	..	..	..	No	Yes	10+	No Change			Yes	Yes		No	5	4	3	2	1	M. V.
Kentucky	1	3	2	40	20	15	Yes	Yes	5	Yes			Yes	Yes		N[1]	1	4	5	3	2	Tax
Massachusetts	2	1	3	30	20	15	No	Yes	5+	No Change			Yes	Yes		N[2]	3	3	1	5	4	M. V.
Minnesota	3	2	1	..	..	..	No	Yes	25%	Yes			No	No[4]		Yes[5]	2	5	1	4	3	H. P.
Mississippi	2	1	3	45	30	20	No	Yes	20+	Yes			No	Yes			3	4	1	5	2	Hwy
Missouri	..	..	..	..	..	..	Yes						No	Yes			3	2	1	5	4	Hwy.
Nebraska	2	1	3	..	..	..		Yes	15	Yes			No	Yes			1	3	2	4	5	Hwy.
New Jersey	3	2	1	..	..	..	Some	Yes	30%	Yes			No	No	2nd		1	5	2	3	4	M. V.
New York	3	1	2	40	25	15	No	Yes	10	No Change			Yes	Yes		N[2]	3	1	2	5	4	M. V.
North Carolina	3	2	1	..	..	..	No	Yes	15+	Yes			No	No		N[1]	1	4	2	5	3	M. V.
Ohio	3	2	1	..	..	..	No	Yes	10-15	Yes			Yes	Yes		N[2]	2	3	1	5	4	Hwy.
Rhode Island	..	..	..	..	..	..	No	Yes	5.6			Yes	Yes	Yes		N[1]	..	..	..	..	..	M. V.
South Carolina	2	1	3	45	30	20	Yes	Yes	20+			Yes	Yes	Yes		Yes	4	3	1	5	3	Hwy.
South Dakota	2	3	1	..	..	..	No	Yes	10+	No Change			Yes	Yes		No	2	3	1	4	5	M. V.
Utah	1	3	2	45	30	25	No	Yes	50%	Yes			No	No	3rd		1	3	2	4	5	M. V.
Vermont	1	3	2	40	30	25	No	Yes		Yes			Yes	Yes		No	..	..	..	..	..	M. V.
Virginia	3	2	1	..	..	..	Yes	Yes	50%	Yes			No	Yes		No	1	2	3	5	4	M. V.
Washington	3	2	1	50	30	20	No	Yes	20%		Yes		No			N[1]	1	3	2	5	4	H. P.
West Virginia	1	3	2	45	25	20	Yes	Yes	10	Yes			Yes	Yes		No	1	2	3	4	5	M. V.
Wisconsin	1	2	3	45	25	20	Yes	Yes	10	Yes			Yes	No	2nd	N[6]	1	2	3	5	4	Hwy.
Totals	56	54	46	..	..	..											53	82	48	111	96	
Replies	26	26	26	13	13	13	26	27	24		27		29	28	4		26	26	26	26	26	
Averages	2.15	2.08	1.77	..	..	..											2.04	3.15	1.85	4.27	3.69	
Analysis	1, 6	1, 7	1, 13	45, 7	25, 5	20, 7	No,	Yes,			Yes, Yes, Yes,		Yes,	Yes,			1, 12	1, 2	1, 11	1, 0	1, 1	
	2, 10	2, 10	2, 6	40, 3	30, 4	25, 2	16	27			18 2 3		15	21			2, 6	2, 6	2, 10	2, 1	2, 3	
	3, 10	3, 9	3, 7	50, 1	20,4	15, 4	Yes,	No,			No Change, 4		No,	No,			3, 5	3, 8	3, 4	3, 4	3, 5	
				35, 1			10	0					14	7			4, 1	4, 6	4, 0	4, 8	4,11	
				30, 1													5, 2	5, 4	5, 1	5,13	5, 6	

N, Note. Hwy., Highway dept. M. V., Motor Vehicle dept. H. P., Highway Patrol. [1] No change in law. [2] Not long enough to tell. [3] Not sufficient data. [4] "Approximately 40% but decreasing rapidly." [5] "Accidents increased when enforcement was originally lifted. However, after a short time of reasonable enforcement accidents started to decrease." [6] "Do not have complete statistics on accidents but believe they have increased materially since the speed limit has been removed."

Comments on Speed-Accident Questionnaire

It will be noted that of the 26 replies to the first question, 13 are in favor of the regulatory principle of reasonable and prudent speed, considering the conditions, rather than the use of definite speed limits, and this principle also stands well in the lead when the ranks assigned to it by all 26 are averaged. The relative ratings of the other two principles are less divergent, the prima facie rule being preferred by a small margin. This rule requires the observance of reasonable and prudent speed considering the conditions, but sets up limits as prima facie indications as to lawful driving. The fixed speed limit operates irrespective of conditions.

Advocacy of the fixed speed limit is qualified in the case of Vermont, Motor Vehicle Commissioner Charles T. Pierce favoring it "if sufficient officers to enforce law." In the case of Missouri, for which no entry appears for question I in the table, Chief Engineer T. H. Cutler of the State Highway Department recomends the prima facie rule for civil actions and the "reasonable and prudent speed" requirement for criminal actions.

"Reasonable and Prudent" Speed

Among reasons advanced for selecting this rule are the following:

With a fixed speed limit, the average motorist has in mind that he is entitled to go so fast; with the speed limit taken off, he knows he is responsible for any accident in which he might be involved if he did not use a reasonable and prudent speed, considering other motorists.—William Cole, Chief, Washington State Highway Patrol.

The "no limit" law took effect June 1, 1931, and has not in our opinion increased the accident rate over previous years; in fact, it is my personal opinion that it has decreased to a certain extent, although when accidents do occur at these high speeds there are more chances of fatalities than at the lesser speeds.—James Pullar, Motor Vehicle Supervisor, Colorado.

Without a definite enforcing unit to enforce the law, the method which places the most responsibility on the individual driver would seem most effective. The reasonable or prudent speed places responsibility in case of accident strictly upon the driver. He is the judge of his own speed as regards safety under varying circumstances.—Victor L. King, Motor Vehicle Commissioner, Kansas

Demand for the use of the highway at full capacity. Improved highways. Improved modern equipment. Demand from the motorists. Drivers more apt to be alert.—Captain George J. Kuch, Traffic Patrol Division, Minnesota Department of Highways.

Impossible to have limits satisfactory under all conditions—prima facie rule, in practice, works almost same as fixed limits, because of ignorance of true character by motoring public and enforcement officers.—Harold G. Hoffman, Motor Vehicle Commissioner, New Jersey.

Speed regulation should be based on the following: condition of road, width of road, alignment of road, weather, volume of traffic and mechanical condition of motor vehicles—Harry E. Neal, Traffic Engineer, Ohio State Department of Highways.

Driving at speed that is proper, road condition being considered; in excess of that, prima facie evidence of reckless driving. A specified speed limit might be all right one day, but dangerous the next.—E. S. Goff, Motor Director, South Dakota.

In the case of Connecticut, no entry was made under question I, but the following comment would indicate a preference for "reasonable and prudent speed":

Speed is a characteristic of operation. It is within the control of the operator. He should fix his own prima facie for his own capabilities, but that prima facie should be kept within reason considering the rest of the traffic and conditions. —Robbins B. Stoeckel, Commissioner of Motor Vehicles, Connecticut.

The Prima Facie Rule

Rhode Island also has no entry for question I, but an illuminating explanation by the chief of the Motor Vehicle Department indicates a preference for the prima facie rule—with a tendency still farther away from fixed limits:

In the absence of a clear definition of your three questions as to speed, I feel it is necessary to say that I know of no speed formula which is as yet accepted as uniformly satisfactory; therefore I feel that the speed regulations of Rhode Island offer a scope of administration and enforcement as logical as any ever thus far heard of. Our law provides that a speed in excess of 20 miles per hour in closely built-up districts and 35 miles elsewhere shall be presumptive evidence of a rate of speed unreasonable and improper. The law further provides that no person shall operate, or cause to be operated, a motor vehicle recklessly or at a rate of speed that is greater than reasonable and proper, having due regard to the width, street intersections, condition, traffic, weather or use of such highway, or so as to endanger property or the life or limb of any person. This system, you will agree, is far removed from a fixed limit. Its advantages, I believe, lie in the opportunity for a process of education of the motorist as to speeds which may safely be used under varying conditions, on the part of administrative and enforcement authorities. The trouble with all speed regulations devised up to this time, in my opinion, is that they fix in the mind of the motorist the idea that he may travel at certain definite rates, irrespective of conditions. It seems to me we have got to get that idea out of the motorist's mind, make him forget all about allowable speeds, and fix his attention on how to drive safely under all the conditions he will be called upon to meet.—George R. Wellington, Motor Vehicle Department, Rhode Island; President, Eastern Conference of Motor Vehicle Administrators.

Vigorous criticism of the abandonment of definite speed limits, and a championing of the prima facie rule, were expressed by Victor W. Killick, Statistician, California Department of Motor Vehicles. He states:

Indefinite speed limits are difficult to prosecute under and confusing to the public. . . .

The difficulty arises out of the ambiguity of the term "reasonable and proper." Under this law the burden of proof as to whether or not a motorist's driving was "reasonable and proper" falls upon the government official, or, perhaps, upon injured persons and those receiving damage, and places them at a considerable disadvantage. The person responsible for the imprudent driving is given more protection under the law than the person injured, in many instances. The law invites a great amount of contest in court with resulting delays and unsatisfactory settlements. . . .

California was one of the first states in the Union to adopt the prima facie basic rule in connection with definite speed limits in zones. This arrangement is considered quite ideal, as it retains the fundamental requirement that the motorist drive safely at all times, irrespective of the maximum speed which he may be permitted to drive in the zones through which he travels. At the same time, this type of law avoids the ambiguous aspect of the term "reasonable and proper" which defies fixed definitions unless recourse is taken to definite speeds as an index of what is "reasonable and proper." . . .

The effectiveness of this law in California has been partially nullified and broken down by the writing into the Vehicle Act of another section restricting the manner of making arrests under it. This restriction has taken the teeth out of the law. Simultaneously, increases in the maximum limits allowed have occurred, so that a true test of the effectiveness of definite limits cannot be made without a consideration of such matters.

The topography of a country has a great deal of bearing on the opportunity of the motorist to indulge in excessive speed. The "reasonable and proper" regulation applying in a small state which has a large mileage of circuitous highways over which a high speed is not encouraged, experiences a very different effect from the application of this law than a state like California having a large mileage of long, straight roads, inviting maximum speed. . . .

Further comments on this rule are:

In Massachusetts we prefer the prima facie rule, principally because it seems to us the rule relating to speeds should be a very flexible one, which will require care and good judgment on the part of the operator at all times and under all circumstances. Our present minimum prima facie speed of 15 mph on corners and curves is often too high for safety. Even 10 mph is often too fast, and much must be left to the discretion of the operator.—Morgan T. Ryan, Registrar of Motor Vehicles, Massachusetts.

Fixed speed limit without adequate police supervision is too often disregarded. No speed limit (a reasonable and prudent speed considering conditions) is not definite and makes placing of responsibility difficult. The prima facie rule places driver in position of responsibility.—A. C. Tilley, Maintenance Engineer, Bureau of Roads and Bridges, Nebraska.

In the case of the 6 replies which show a preference for fixed speed limits over the other two methods of regulation, supplemented by 7 others giving recommended speeds, although not advocating fixed limits, a speed of 45 miles per hour for rural conditions gets the preference. For residential streets the speed limit of 25 mph is preferred in 5 replies as against 30 mph in 4, and 20 mph also in 4, while for business districts the prevailing preference is 20 mph.

Effect of Speed Laws

In regard to the second question, 16 replies state that present speed laws have no appreciable effect in controlling average driving speeds on the open highway, while 10 believe that they do. The following comments are of interest:

We have had a continuous period of education in traffic movement which has extended to all operators in the state through publicity and direct information. Average driving speeds on the open highway are now reasonable and fair, although they are much faster than they used to be.—Robbins B. Stoeckel, Connecticut.

I believe the present state speed laws affect driving speeds only to the extent of their enforcement. The motorist is inclined to drive at such speed as his whim of the moment dictates, regardless of legal speed limits. We must therefore rely upon teaching him what a safe speed is and compel his respect for it.—George R. Wellington, Rhode Island.

Increased Speed

The replies to the first part of question III are unanimous that average rural highway speeds have increased in recent years. In most cases the increase is stated to amount to 10 miles per hour or more. A majority (18) believe that these speeds will increase slowly in the near future; 2 believe this increase will be rapid; while 7 others believe there will be no increase, 3 of these actually expecting a decrease.

In Rhode Island for several years speed observations of a great number of cars have been made over measured courses with a stop-watch. Mr. Welling gives the following table showing speed and accident trends during that period:

	Average Rate of Speed	Fatal Accidents	Non-Fatal Personal-Injury Accidents
1925.....	25.6	135	3,421
1926.....	29.2	112	4,008
1927.....	31.4	123	4,425
1928.....	35.1	145	4,526
1929.....	36.9	128	4,826
1930.....	31.2	106	4,426
1931.....	30.2	109	4,180
1932.....	....	92	3,723

Speed vs. Accidents

As to question IV, whether high speeds alone are a frequent cause of accident, opinion is closely divided, 15 replies being in the affirmative and 14 negative. Commissioner Stoeckel of Connecticut comments, in the affirmative:

When a man drives too fast for his capability, whether 45 or 100 mph, he gets into trouble. He is more apt to drive outside his capabilities of fast speeds than slow. There are accidents occasioned by speed alone where an operator has not adequate self-knowledge and tries to do things which by reason of conditions or physical inability are unsafe for him.

The replies to question V, however, relating to high speeds in combination with other actions and conditions, are more conclusive: 21 replies maintain that this is the most frequent cause of accidents, with 7 holding to the contrary.

Comments of special interest are:

It is not the most frequent cause, but speed is a contributing cause in many accidents, which makes them more serious than they otherwise would be. The main cause of accidents lies, without doubt, in the personality of the operator. —Robbins B. Stoeckel, Connecticut.

We have a field staff of investigators and examiners who carefully collect the facts surrounding all fatal accidents and hundreds of the non-fatal type of accidents annually, and analysis of these facts forces me to the conclusion that speed is the basic cause; in other words, were cars operated at the time at a lesser speed, the ensuing better control might have prevented an accident.—George R. Wellington, Rhode Island.

In regard to question VI, only 4 replies state that changes in the state speed laws during the preceding three years had had an appreciable effect on the number of motor-vehicle accidents.

Activities for Greater Safety

Among the activities thought to be most productive of greater safety, as called for in question VII, first place, as indicated by the smallest average rank among all replies (1.85), is accorded to the elimination of the accident-prone and reckless driver by license suspension and revocation. This received 11 votes for first choice out of 26 replies; but the next most favored activity (average rank, 2.04)—education in safe driving practices directed to all drivers in general—received 12 first choices. Following this in importance comes such education concentrated on the accident-prone and reckless driver. Fourth and fifth places, respectively, are given to the building of safer highways and safer motor vehicles, indicating that, in the opinion of motor-vehicle administrators, present highways and motor vehicles are not so susceptible to improvement in safety factor as is the human element.

Special comments include:

As to question VII, the most important thing in connection with safety in operation is not there at all. That is the selection of operators through an examination which will take into account their personal characteristics and ability and general attitude towards the public. When a sufficiently searching examination of this kind is evolved and put into practice, an immediate drop in the accident rate will result. We can show that experience in Connecticut now after only a short trial.

All of the matters indicated under VII must be present. There are two or three of them which are not expressive in the manner in which they are asked. If you built an absolutely safe highway and an absolutely safe motor vehicle, supposing those could be con-tructed, you would be losing the necessity of the operator to be cautious and careful, and he might and probably would become careless enough by reason of the safety of these two elements, so that he would get caught unawares by something which the builders of either had never thought of. Accidents do not occur in obviously dangerous places, but only in places which are obviously safe, but which, by reason of some latent factor not noticed, are unsafe for certain people. While I have marked these questions in the order in which I prefer them, I do not think they are anywhere near expressive of the necessities of the case to meet the whole problem.—Robbins B. Stoeckel, Connecticut.

My first choice would of course be (a). I cannot accept any restricted definition of item (b), believing that all drivers at present are more or less accident-prone. Item (c) is more important in backing up (a). The suspension of the driver who is non-cooperative in making for highway safety until he gets into that frame of mind, is highly salutary. We have, for some years, been building safer motor vehicles and safer highways, yet it is significant that the accident peak rises higher and higher. I am firmly convinced of two things, the necessity for educating the driver in safe practices, and the equal necessity of compelling him to adhere to them.—George R. Wellington, Rhode Island.

Additional remarks given under the eighth and last part of the questionnaire include, as of special interest:

If you include the thousands of property damage accidents of which the state keeps no official record, speeds do not have a great bearing on the frequency. However, if you consider "injury accidents," speed as an important factor tops the list. If you consider traffic deaths, speed is positively the most dominant factor. We have found the number of persons killed in a wreck varies in something like a geometric proportion upward with the speed involved.—Victor W. Killick, California.

Higher average driving speeds are possible with a minimum average of accidents only when the highways are constructed to take care of such higher driving speeds, and the equipment so constructed with the matter of control and safety principally in view. The driving public must be aware of the *actual*, not the mere theoretical enforcement of the motor-vehicle laws before they will use caution in regard to speed, equipment and reckless driving. The stricter the requirements and the enforcement, the lower the average or per cent of accidents should be, at the same time making possible an even higher average traveling speed.—Victor L. King, Kansas.

We have recently been conducting two special highway safety campaigns. The results show without question that the two main causes of motor-vehicle accidents are high speed combined with other factors such as inattention at intersections, cutting in and out of line, and indulgence in intoxicating liquor.—Morgan T. Ryan, Massachusetts.

I do not believe that excessive speed can be indulged in without increased accidents unless proper enforcement and supervision is put into effect. All conditions must be considered. We believe this fact will compel the motorists to exercise greater care than in cases where the speed limit is enforced. In other words, it is left entirely to the motorists to decide the speed they may travel, and we do not find them governing themselves by the maximum provided by law.—George J. Kuch, Minnesota.

The Lincoln Statue in Wabash, Indiana

LAST Memorial Day found thousands of people congregated on the Courthouse lawn in Wabash, Ind., waiting expectantly before a flag-shrouded figure looming above the crowd. After an impressive ceremony the large flag was raised, unveiling a magnificent statue of Abraham Lincoln, seated, in an attitude of solemn meditation.

This impressive work of art, shown on the front cover of this issue, was a gift to his native city by the late Alexander New, prominent attorney and business executive of Kansas City and New York. It is the work of the eminent sculptor, Charles Keck, of New York, and has been acclaimed by capable critics as one of the very finest of all Lincoln statues.

The story of this gift and its donor goes back over seventy years. In 1861 there came to Wabash a young Jewish couple who had emigrated from Bavaria, married in New York, and then pushed forward into the new West to make their home. In June of that year their first son was born, Alexander New.

Mr. New lived in Wabash until his young manhood, reading law in his spare time after school. After graduating from Washington and Jefferson College, he went to Kansas City, where he was admitted to the bar. Following busy years of success there as a corporation lawyer, Mr. New went to New York to become president of the Mercantile Stores Company, which he developed into one of the largest organizations of its kind in the country. He remained as head of this company until his death in April, 1931.

In his later years there gradually formed in Mr. New's mind a plan to present to his native city some lasting and inspiring gift in memory of his father and mother. As a student and admirer of Abraham Lincoln, he made a natural decision. One of his earliest recollections was of the Lincoln funeral train when it passed through Wabash. The commission for the statue was given Mr. Keck several years before Mr. New died.

JOHN L. FORD,
Wabash, Ind.

Recent City Manager Appointments

J. V. GRANT was appointed City Manager of Cornelia, Ga., on January 1, to succeed C. C. Currier, who had held that position since 1930.

Burt P. Hatch, City Assessor, succeeded I. R. Ellison as City Manager of Muskegon, Mich., on January 1. Mr. Ellison has been City Manager of Muskegon since the commission-manager form of government was adopted in 1920.

C. S. James succeeded J. E. Childs as City Manager of Bartow, Fla., on January 3. Mr. Childs was appointed in 1925.

Earl D. Mallery, for the past four years President of the City Council of Alliance, Nebr., was appointed to fill the vacancy in the position of City Manager caused by the sudden death of Laurence A. Goines on December 18. Mr. Goines had served that city since June, 1925.

CLARENCE E. RIDLEY,
Executive Director, The International City Managers' Association.

Prepared by
FRANK B. WILLIAMS
Author of "The Law of City Planning and Zoning"

ZONING and PLANNING NOTES

From Data collected by the Zoning Committee of New York (233 Broadway)

Private Restrictions

IOWA.—*Burgess v. Magarian*, 243 N.W. 356 (Supreme Court, June 24, 1932).—Burgess, the owner of a considerable tract of land, subdivided and sold most of it in lots to various persons. Magarian became the owner of two of these lots, the deeds conveying them containing, among others, the following restrictions:

"No building or any part thereof shall be placed nearer than 35 feet to the front line of said property."

"No business or store building shall be placed or constructed on said lot."

Subsequently, in 1926, the property was zoned as commercial. In 1929 Magarian obtained a permit to erect a gasoline filling station on it. *Held* that the permit was rightly cancelled. The zoning ordinance does not by its terms abrogate the private covenants, and cannot do so. Both the covenants and the ordinance must be complied with. Practically, therefore, it is the most restrictive provisions that must be regarded.

NEW YORK.—*Moos v. Duany*, Supreme Court, Westchester County, reported in *Westchester Law Journal*, January 3, 1933.—The plaintiffs seek a declaratory judgment that the proposed use of their premises by the defendants would constitute a violation of the restrictive covenants in defendants' deed and a violation of the zoning ordinance of the village of Rye; and an injunction. The fourth and fifth covenants in these deeds, when read together, prohibit "any manufactory business industries or other stores" upon the premises, and provide that they shall be used only for residential purposes. The defendants have a private dwelling on their land and propose to add an extension to it in order to let rooms to roomers. *Held* that defendants proposed to go into a business, and make a use of the land which was not residential. This is a violation of the restrictive covenant.

The property of the defendants is in a "residence A" zoning district in which the use of premises for commercial purposes or any purpose except a single detached house for not more than one family or housekeeping unit is forbidden; except that an accessory use of the premises for the incidental keeping of non-transient boarders or roomers by a resident family is permitted. Clearly this is not the use intended by the defendants. The plaintiffs are therefore entitled to judgment both on the covenants and on the zoning ordinance.

EDITOR'S NOTE.—This is perhaps the only case which in the same action and for the same acts gives relief on a private covenant and a public or police power zoning regulation.

Zoning—Notice

LOUISIANA.—*State ex rel. Holcombe v. City of Lake Charles*, 144 S. 502 (Supreme Court, October 31, 1932).— This is mandamus to compel the building inspector of the city to allow Holcombe to construct and operate a gasoline filling station, contrary to the provisions of a zoning ordinance forbidding, in the given district, the construction of any building for a commercial or business use. Holcombe claims that the ordinance is void because the notice and public hearing required by statute were not given.

Two weeks after this suit was filed another zoning ordinance affecting Holcombe was passed. In the case of each of these ordinances the law provided that it should not be effective until after publication in a specified manner. Neither ordinance was so published. *Held* that the Legislature had the right to prescribe notice, hearing and publication, and the ordinances were of no effect unless these provisions were complied with.

EDITOR'S NOTE.—Provisions with regard to the passage and effect of legislation are of two kinds: some are directory, the statute or ordinance being valid and effective without compliance with them; others are jurisdictional, the measure being of no validity or effect without such compliance. The requirements in this case were of the latter class.

Zoning—Variance

MASSACHUSETTS.—*Coleman v. Board of Appeals of Building Department of Boston*, 183 N. E. 166 (Supreme Court, November 30, 1932).—This is a petition for a writ of certiorari. The petitioner is the owner of premises in a residential district. One Galassi is the owner of premises diagonally opposite. He applied to the Commissioner of Buildings of Boston for a permit to alter the apartment building on his premises by remodeling the ground floor for business. The Commissioner refused the application. From this decision Galassi appealed to the Board of Appeals.

The Board finds, in effect, that the applicant is hemmed in by a funeral home, stores, garages and commercial enterprises; that there is no demand for his apartment; that automobile traffic is so incessant as to be a possible menace to the health of occupants of the ground floor; that the neighborhood is no longer suitable for residence. The Board therefore annuls the decision of the Building Inspector and allows the variance on the ground of practical difficulty and unnecessary hardship, thus permitting Galassi to make the desired alteration. On appeal to the Court, it holds that these findings are insufficient as a matter of law to warrant the conclusion that the literal enforcement of the zoning ordinance would involve practical difficulty or unnecessary hardship. "It is only in rare instances and under exceptional circumstances that relaxation of the general restrictions established by the statute ought to be permitted."

EDITOR'S NOTE.—This case illustrates the narrow limits within which the Massachusetts law confines variances. Under most of the modern zoning laws it seems clear that a variance would have been granted and Galassi allowed to make the change in use he asks for.

NEW JERSEY—*Fonda v. O'Donohue*, 163 Atl. 2 (Supreme Court, November 12, 1932).—These are proceedings by Fonda and others for a writ of certiorari to review decisions of the Board of Adjustment and the Board of Commissioners of the city of Orange, recommending a special exception to the zoning ordinance. The Women's Club of Orange applied to the Building Inspector for a permit to construct a club-house, an auditorium and a concreted parking area in a residential district. The Inspector refused the permit on the ground that such a use was forbidden in a residence "A" district. The Club appealed to the Board of Adjustment for a special exception.

Under the New Jersey statute the Board of Adjustment can grant a variance from the strict letter of the zoning ordinance for unnecessary hardship only provided no structure is thus permitted in a district restricted against it unless the land on which the structure would be erected abuts a district in which such a structure is authorized by the zoning ordinance; and provided further that such structure shall not be more than 150 feet from the boundary line of the district in which such a structure is authorized by the zoning ordinance. In other cases, the Board of Adjustment is authorized only to recommend the variance to the governing body of the municipality; and that body may approve or disapprove of the recommendation as it sees fit.

The premises of the Women's Club did not abut or lie within 150 feet of any such district. The Board of Adjustment, therefore, being in favor of the application, recommended it to the Board of Commissioners of the city; and the Board authorized the variance and ordered the permit to be issued to the Women's Club. From these decisions neighbors brought certiorari to enable the Court to review them and asked the Court to reverse them The Court held that there was no evidence upon which the Board of Adjustment should have made such a recommendation or the Board of Commissioners should have approved of it.

EDITOR'S NOTE.—There is nothing stating clearly in the New Jersey statute whether when the Board of Adjustment recommends a variance, as in this case, to the legislative body of the municipality, and that legislative body acts upon it, the latter body is acting in a legislative capacity (in which case its acts would not be subject to court review and therefore there could be no relief from action thought by any interested party to be wrong, which he could demand as a right) or an administrative or semi-judicial capacity (in which case there would be such a right). This case is important because it is the first one to be decided, by allowing certiorari, that the action of the legislative body in such cases is administrative or semi-judicial.

NEW YORK.—*Matter of Ozark Realty Corporation (Connell et al)*, reported in *New York Law Journal*, January 4, 1933

(Supreme Court, Kings County).—This is a writ of certiorari to review the decision of the Board of Standards and Appeals in refusing a variance in a use district in New York City for practical difficulties or unnecessary hardships. The reviewing Court decides in this case that the Board of Standards and Appeals should have granted the variance, the testimony given before the Board indicating, in the opinion of the Court, that the Board "maintained a closed mind" on the question of hardship.

An application by a prior owner was denied in 1928. A remark by the Chairman of the Board indicates and apparently rules that the question of hardship was not being considered at this hearing, in 1931, because of the prior determination. Such an attitude was clearly illegal and not a proper exercise of discretion by the Board.

On several questions no testimony was taken. The members of the Board might, on account of their special qualifications, have decided these questions on their own personal knowledge; but if so, there should be a disclosure on the record of the facts upon which they base their conclusion, so as to "enlighten a reviewing court"; and there was no such record. For this reason the Court took additional evidence with regard to the surrounding physical conditions, and granted the variance allowing the erection of a garage as sought.

Zoning—Residential District—Product of Soil

OKLAHOMA.—*Gant v. Oklahoma City*, 15 Pac. 2d, 833 (Supreme Court, June 21, 1932).—A zoning ordinance gives the city the power to restrict realty within the city in the production of oil and gas. Acting on this power, the city required Gant to give a bond of $200,000, with a proper surety, probably as a condition to the drilling of oil wells, etc., in a residential district. *Held* that this requirement was valid.

EDITOR'S NOTE.—The bond required was a large one. The courts in most jurisdictions have allowed the extraction of sand, clay and other natural products for removal in residential districts. Apparently conditions have led courts and legislatures in parts of this country to regard heavy restrictions on the oil industry in such districts as reasonable.

Garages

Edward M. Bassett has written an article, appearing in *The New York Times* and other New York City papers the latter part of December, on private garages under the zoning regulations of New York City.

Zoning in Michigan

Bulletin No. 1 published by the Michigan Planning Conference, Ann Arbor, entitled "Zoning in Michigan," is a digest of legislation and court decisions and a summary of progress in zoning in that state.

Planning and Zoning in Los Angeles

The Board of City Planning Commissioners of Los Angeles has issued its annual report for the fiscal year 1931-1932. It appeared in June, 1932.

Testing the Validity of Zoning Ordinances

An interesting article reviewing the various legal methods of bringing zoning ordinances before the courts in order to determine whether or not they are valid under different conditions and circumstances will be found in the *Westchester Law Journal* for September 22, 1932.

Fifteen Present-Day Points on City Planning and Zoning

By **ARTHUR C. COMEY**
Consulting City Planner, Cambridge, Mass.

OFFICIAL city planning under eminent domain, as proposed by the "Nichols bill" in Massachusetts, is a useful supplement to police-power methods. It alone will permit the collection of cash for benefits resulting from city planning, an idea supported in England by Sir Raymond Unwin.

The *official* city plan under police power might, as far as legal requirements go, consist merely of the succession of adopted "mapped streets" accumulating from time to time on the city map.

The *official* city plan might include streets, parks, sites for public buildings, and utility locations, as well as zoning. It should require the same three-fourths or unanimous vote to change the official city plan in case of objectors as is required to change the zoning plan.

If an official "as is" map is to be adopted, the enabling act should be so worded that wherever the actual streets may for any reason vary from the lines of streets shown on the "as is" map, the latter shall be merely "mapped streets" and shall not bind the city actually to vacate parts of streets outside the new lines, any more than it actually creates streets within the new lines.

The master plan is a general guide and should include not only all features on the official plan but also all other features deemed pertinent to the particular city's planning.

One should distinguish between planning powers given to cities and planning powers or duties given to boards. Cities should be authorized by a permissive act to give powers by platting control to planning boards.

County planning is a valuable form of regional planning. It should comprise such inter-town matters as highways, and those things located in one town but serving others primarily,—as county parks,—and may include preliminary planning of all towns and other areas not otherwise planned.

Zoning laws might provide for alternates in case one or more members of a board of appeals are interested parties in a case or unavoidably out of the state or ill.

Powers of boards of appeal might be confined to righting wrongs involving questions of constitutionality of the ordinance as applied literally to the particular property.

The words "practical difficulty" and "unnecessary hardship" might be replaced in the act so as to restrict variances to cases of substantial hardship unnecessary to the public good, pertaining to the particular appellant but not to the zone in general.

In case a building permit is granted by the building inspector, no aggrieved third party should have the right of appeal to the board of appeals. Injunction is the proper procedure. An appeal may be flippant or malicious, may unnecessarily delay construction, with loss of money, and may permit hold-ups. It is difficult to force the board to meet or to act. Injunction is swift and positive in action.

It might be required by law that no dissatisfied person may resort to mandamus until after he has appealed to the board and, if still dissatisfied, has gone to the court on certiorari.

There should be specific authority in the zoning act to zone as to lot sizes and lot widths. This is a popular feature, bears directly on health, and is an invaluable additional supplemental aid to platting control.

Transition zoning, or the easing-off of the sharp boundary between two zones by special provisions, is a valuable refinement now utilized in one or more of its thirty-six principal types by two-fifths of all zoned cities in the United States.

"Linear" zoning along highways is a legal form of zoning, provided it divides the towns into two zones (in addition to zones in the village centers): (1) all land within, say, 150 feet of any main highway; and (2) all land not thus situated. It is presumably within the state's power thus to zone all parts of the state not zoned by the towns.

To add to the convenience and beauty of our cities, and to preserve and make accessible the charm of the countryside, are among the best ways to increase our permanent community wealth.

H. S. B.

Cutting Costs and Maintaining Standards in the Public Schools*

IN the present crisis . . . Chicago and Illinois in company with other cities and states must make a choice between: (1) revising an obsolete system of taxation and replacing it by one which places a fair share of the burden of educating the boys and girls of the state upon every dollar of taxpaying ability, or (2) offering the children of this generation a restricted and inferior educational opportunity. There is evidence that the great mass of the states of the Union are taking the first of these choices. No less than 25 states have taken definite steps since 1930 toward modernizing their tax systems. Chicago should throw its influence in the direction of adding Illinois to these states. . . .

It is a questionable doctrine that children should pay the price of the economic stupidity of their elders. . . . In making the choices which must be made, we should be careful not to lay too much stress upon retrenchment in essential public services.

What revisions should be made in the existing methods of securing tax revenue in order to insure adequate financial support for the schools? Chicago now raises practically all of its school money through a local, general property tax. The type of tax now in effect in Chicago has been called "the worst tax known in the civilized world." The uniformity clause of the Illinois constitution requires that all property, both real and personal, be taxed on the same basis. The repeated experience of other states has shown that such a tax cannot be efficiently administered. Intangible personal property is extremely difficult to enumerate. Chicago's current experience in this regard is typical. As a result, the majority of states have modified their laws affecting the taxation of intangible wealth. The property tax is applied only to real estate and tangible personal property. This does not mean that the owners of the vast amounts of intangible wealth which exist in Chicago should be excused from bearing a just share of the burden of governmental costs. Personal and corporation income taxes of the type already in successful operation in a number of states would guarantee a proper contribution to the cost of public enterprises by all persons with taxpaying ability.

The modernization of the obsolete system of taxation now in effect should be accompanied by an increase in the contribution of the state government toward the support of education. . . .

Chicago has a school system which is basically sound. Like any human institution, it can be improved, and the survey staff has not hesitated to point out the directions of improvement. But it is equally true that the school organization has been maintained at a reasonable level of efficiency by a loyal personnel in the face of difficulties which are perhaps greater than any large school system has had to contend with in recent times. It is no light matter to urge reductions in financial support which threaten to wreck such a school system. The survey staff is unwilling to recommend such a course.

Rather, it is urged that the basic structure of the schools be preserved and that, if it is financially impossible to operate them at a reasonable level of efficiency for a full school year during the present fiscal emergency, they be maintained at such a level for less than a school year. This will guarantee that the children will be in good schools for such time as they are in school. A wise parent would prefer to have his child in a good school eight, or even seven, months a year, than to have him in a poor school ten months. . . .

The survey staff recommends that (a) as soon as credit is reestablished in Chicago and an adequate system of taxation adopted, the Board of Education cause to be determined the amount of money necessary to carry out a building program that will relieve seat shortage and replace all unsafe and inferior buildings, and that a bond election be called for the purpose of authorizing the issue of bonds in such amount as may be required to bring the school plant up to date; and (b) thereafter the city employ the direct-tax method of raising all funds necessary to the replacement of obsolete and inadequate buildings and under normal circumstances also provide for expansion. . . . The pay-as-you-go plan is all right, providing it goes fast enough to keep up with the demand, but in Chicago it did not do this, and now the children must bear the burden of neglect.

* Extracts from the "Report of the Survey of the Schools of Chicago, Illinois" (1932), made by the Division of Field Studies, Institute of Educational Research, George D. Strayer, Director, Teachers College, Columbia University. (See the Department of Municipal and Civic Publications, p. 88, THE AMERICAN CITY, January, 1933.)

Slum Clearance and Land Values

To the Editor of THE AMERICAN CITY:

Many square miles of urban area in the United States are crowded with dilapidated, filthy buildings, in which live millions of unfortunate submerged people. From these slums flows a steady stream of disease and crime, against which society in defence spends an ever increasing amount of money for police, prisons, hospitals and insane asylums. Thinking men and women have demanded for generations that these slums be torn down and replaced with decent buildings. But they pass on and little is done. And yet there are millions of idle building contractors, architects, and workingmen who would be overjoyed to find employment in slum clearance. Plainly, something is not clicking in our economic machinery.

During the several years since New York enacted its State Housing Law, only 11 million dollars worth of projects have been put through under it. But New York City alone has real estate assessed at more than 18½ billion dollars. It is apparent that this rate of progress would not solve slum clearance in a century.

Since the enactment last summer of the Emergency Relief and Construction Act of 1932, under which the Reconstruction Finance Corporation is authorized to make loans for slum clearance or low-rent housing projects, some other states have enacted laws under which limited-dividend housing corporations may be able to secure R. F. C. funds, and similar legislation will doubtless be considered in other states during the sessions of 1933. It seems quite certain, however, that unless some fundamental attack is made on the problem of land costs, New York's unsatisfactory experience will be repeated elsewhere.

What is this land value which seems the stumbling block in the way of slum clearance? It is an imponderable. You cannot feel or see land value. You can't buy a quart of it or measure off a yard of it. But in New York City the Tax Department assessed it at 9 billion dollars for 1932. This has nothing to do with buildings, which were assessed at 9½ billions. Five per cent interest on 9 billion dollars is 450 million dollars, and that is what goes yearly into the pockets of the owners of New York City's land. Add to this 230 million dollars, which is the city's yearly tax on land value, and the answer is 680 million dollars, the yearly land rental of New York City. Dry figures, to be sure, but the Klondike in all its glory never produced that much money in one year. This means that before buildings or improvements can earn a cent, there must be paid to the title holders of New York City land 680 million dollars, and of this sum the city takes one-third in taxation.

So in New York and elsewhere, the pestilential slums cannot be cleaned up and replaced with buildings that will raise self-respecting, clean, healthy Americans, until we first tackle the selling value of the land underneath the slums. No matter how we arrange, whether through specially cheap financing or building tax exemption, or if through invention and progress we cut the cost of building in half, the Frankenstein of land values will stand in the path. To ignore him is a flight from reality. In the long run, buildings must be wholly tax exempt, and the selling value of land must be largely eliminated by the city's taking the major part of the yearly ground rent in taxation. This fundamental reform can be accomplished gently and softly, over a period of twenty or thirty years, by gradually transferring all taxation from buildings to land values, and thereby avoiding any serious financial disturbances; but it must be done.

New York. HARRY MAGUIRE.

THE CITY'S LEGAL RIGHTS AND DUTIES

Conducted by A. L. H. STREET, Attorney at Law

Accidents

City held liable for injury to pedestrian who tripped over defective drain cover (Louisiana Court of Appeal: *Geismar v. City of Alexandria*, 142 So. 367).

City held liable for injury to pedestrian falling on sloping sidewalk worn smooth (Kansas City, Mo., Court of Appeals: *Lampe v. Kansas City*, 49 S. W. 2d, 627).

Leaving stakes near sidewalk held nuisance, rendering city liable for fatal injury of boy tripping over one and falling on other (Connecticut Supreme Court of Errors: *Capozzi v. City of* Waterbury, 160 Atl. 435).

Business Regulations

Ordinance regulating jewelry store auctions held invalid as being unduly burdensome (Texas Commission of Appeals: *Sam's Loan Office v. City of Beaumont*, 40 S. W. 2d, 1089).

Denial of license for music and dancing in restaurant was discretionary with city (New Jersey Supreme Court: *Hudson Royal Restaurant v. Mayor and Aldermen of Jersey City*, 160 Atl. 218).

Penal ordinance governing inflammable oil magazines held void for indefiniteness, discrimination and excessive penalty (Iowa Supreme Court: *Edwards & Browne Coal Co. v. City of Sioux City*, 240 N. W. 711).

Civil Service

Council was necessary party to mandamus proceeding to compel reinstatement of policeman removed on resolution of council (Michigan Supreme Court: *Daniels v. Dundon*, 241 N. W. 718).

Mayor held not authorized to hear charges against borough solicitor (New Jersey Supreme Court: *Penn v. Mayor of Borough of Collingswood*, 160 Atl. 761).

Prohibition against dismissal of honorably discharged soldiers without cause held to apply only to positions for which no tenure is fixed by law; not preventing removal on expiration of fixed term (New Jersey Supreme Court: *Giorando v. Brady*, 169 Atl. 761).

Council Vacancies

Councilman vacated office by removing from ward where he resided when elected (Pennsylvania Court of Common Pleas, Montgomery County: *Commonwealth v. English*, 23 Pa. Munic. Law Rep. 146).

Council Votes

Vote of mayor and half of aldermen held majority vote of council (Illinois Supreme Court: *Siegel v. City of Belleville*, 181 N. E. 687).

Finance

Conveyance of school property held invalid as unauthorized mortgaging (Kentucky Court of Appeals: *Hardin v. Owensboro Educational Assn.*, 50 S. W. 2d, 968).

Municipal contract for purchase of realty held, at most, irregular and not void for assumption of existing mortgage (Illinois Supreme Court: *Stripe v. Yager*, 180 N. E. 915).

Initiative Proceedings

Petition to abolish city manager's office and vest powers in commission held to require charter revision, not mere amendment (Michigan Supreme Court: *Kelly v. Laing*, 242 N. W. 891).

Important Legal Decisions

involving municipalities, as reported in this department during 1931, are indexed and classified in The Municipal Index for the year 1932. This reference list, commencing on page 127 of the 1932 Index, supplements similar lists appearing in the 1931, 1930 and 1929 volumes, while the 1928 Index contains a list covering 1924 to 1927, inclusive.

Licenses

Wholesale baker's agent held not peddler within meaning of licensing ordinance (Springfield, Mo., Court of Appeals: *City of Aurora v. Stafford*, 51 S. W. 2d, 547).

$1,500 weekly license fee for carnival in small city held invalidly imposed as being excessive (Kentucky Court of Appeals: *Ziedman & Pollie v. City of Ashland*, 50 S. W. 2d, 557).

Ordinance imposing license tax upon filling stations held not invalid as being unreasonable (Illinois Supreme Court: *Fligelman v. City of Chicago*, 180 N. E. 797).

Lobbying

Expense for promotion of municipal interests before Legislature upheld (Alabama Supreme Court: *Fitts v. Commission of City of Birmingham*, 141 So. 354).

Municipal Airports

City has power to regulate its airport lying beyond municipal limits (California Supreme Court: *Ebrite v. Crawford*, 12 Pac. 2d, 937).

Official Eligibility

Statute forbidding dual office-holding held not to render incumbent of one office ineligible to another; his acceptance of second automatically vacating the first (Alabama Supreme Court: *State v. Herzberg*, 141 So. 553).

Parks

Park board justifiably refuse to permit construction of road through park (California District Court of Appeal: *Olmsted v. City of San Diego*, 12 Pac. 2d, 22).

Police Department

Commissioner held not entitled to maintain mandamus proceedings to compel payment of patrolmen's salaries (Massachusetts Supreme Judicial Court: *Police Commissioner for City of Boston v. City of Boston*, 181 N. E. 790).

Municipal economy held not to justify abolition of police force position created by statute (Rhode Island Supreme Court: *Eaton v. Town Council of Town of Warren*, 161 Atl. 225).

Poor Relief

Municipality furnishing necessaries to wife and children held entitled to reimbursement against husband and father (South Dakota Supreme Court: *Haakon County v. Staley*, 243 N. W. 671).

Public Works

Statute fixing minimum wage schedules on public works upheld (California Supreme Court: *Metropolitan Water District of Southern California v. Whitsett*, 10 Pac. 2d, 751).

Statute forbidding employment of aliens on public works upheld (California Supreme Court: *City of Pasadena v. Charleville*, 10 Pac. 2d, 745).

Sewers

Statute of limitations held to bar claim for damages caused by sewage discharge from permanent outlet (Kansas City, Mo., Court of Appeals: *Kent v. City of Trenton*, 48 S. W. 2d, 571).

Statute held to validly empower city to discharge untreated sewage into Hampton Roads, despite injury to fisheries, etc. (Virginia Supreme Court of Appeals: *Commonwealth v. City of Newport News*, 164 S. E. 689).

Street Pavement

Contract for concrete paving 5 inches thick held not substantially complied with by 4½-inch paving (Texas Court of Civil Appeals: *Shambaugh v. Wilson*, 51 S. W. 2d, 637).

By signing a petition for street paving one does not lose right to attack validity of assessment lien (Louisiana Court of Appeal : *State v. City of Shreveport*, 142 So. 641).

Water Supply

School district held liable for water supplied by borough having coextensive boundaries (Pennsylvania Court of Common Pleas, Schuylkill County: *Shenandoah v. Shenandoah School District*, 23 Pa. Munic. Law Rep. 158).

MUNICIPAL AND CIVIC PUBLICATIONS

Prices quoted do not include postage, unless so stated.

Public Works

Those who seriously desire to encourage state legislation for the advance planning of public works by state and local government will find definite help in a mimeographed pamphlet of information compiled by the American Engineering Council, the American Institute of Architects and the Associated General Contractors, in collaboration with the Federal Employment Stabilization Board, and issued Jan. 3, 1933. It was decided to make use of principles rather than legislative language, hence the compilation opens with a suggested outline of principles for guidance in the formulation of state legislation providing for the advance planning of public works. Then follow a copy of the act creating the Federal Employment Stabilization Board, and drafts of proposed acts in California, Connecticut and Massachusetts providing for the advance planning of public works; a list of thirty advantages of such planning, stated by D. H. Sawyer, Director of the Federal Employment Stabilization Board, and reprinted from the December, 1932, issue of THE AMERICAN CITY; three sets of resolutions endorsing advance planning, adopted respectively by the Metropolitan Section of the American Society of Civil Engineers, the American Municipal Association, and the National Conference on City Planning; instructions and forms of the Federal Board; a reprint from *Engineering News-Record*, July 28, 1932, on "The Cost of Federal Public Work"; and an address by Mr. Sawyer before the National Conference on City Planning, Nov. 15, 1932, on "New Opportunities for Planners in the Advance Planning of Public Works." (Apply to the Federal Employment Stabilization Board, Dept. of Commerce Bldg., Washington, D. C.)

Taxation

"Comparative Tax Rates of 277 Cities, 1932," by C. E. Rightor, of the Detroit Bureau of Governmental Research, is a 16-page reprint from the December, 1932, issue of the *National Municipal Review*. The cities are listed in order of population, by the five census groups over 30,000. The tables include the following information: date of beginning of city's fiscal year; date, or instalment dates, of tax collection; tax rate per $1,000 assessed valuation upon a uniform legal basis, separately for city, school, county and state, and the total; and the estimated ratio of assessed value to legal basis, and the adjusted rate—the essential relative tax burden upon the taxpayer, as opposed merely to the tax rate. The amount of property taxes levied in 1932 is definitely reduced in at least 115 cities, but the ratio of assessed value to legal basis must be taken into consideration when interpreting these reductions. (Apply to the Detroit Bureau of Governmental Research, Inc., 936 First National Bank Bldg., Detroit, Mich.)

County and Township Government

"Preliminary Report of the State Commission of Inquiry into County, Township and School District Government, State of Michigan."—December, 1932. 31 pp. This report is based on studies of local government in six typical counties in Michigan, including the following divisions of the subject: social and economic background of local government in Michigan; organization of county and township government and the possible consolidation of county governments; rural school government; local and school government in the metropolitan area; debt and taxation in local governments; organization and administration of public welfare, public health, public works and justice, and of the miscellaneous services of local government. The Commission recommends to the Legislature the creation of a state municipal commission to have jurisdiction over taxation, debt, and the financial affairs of units of government in default, including for these defaulted units the power to levy taxes and to enact the current budget. (Apply to Clarence L. Ayres, Chairman of the Commission, 600 Fidelity Bldg., Griswold St., Detroit, Mich.)

Asphalt Road Construction

"Specifications for Liquid Asphaltic Road Materials Recommended by The Asphalt Institute"; Asphalt Road Construction Series—Manual No. 2: "Surface Treatment Types," illustrated. 14 and 128 pp. The specifications have been developed as the result of numerous conferences with representatives of the U. S. Bureau of Public Roads and the various state highway departments, and supersede former Specifications Nos. 1 to 7 inclusive of The Asphalt Institute. The Manual is the result of a nation-wide study and shows the best engineering practice in meeting every surface requirement. "By proper surface treatment operations a large part of the highway system may be effectively and economically transformed into good year-around roads." (Apply to the Institute, 801 Second Ave., New York.)

Federal Highway Aid

The preservation of our interest in highway investments is urged by Willard Chevalier, Publishing Director of *Engineering News-Record* and *Construction Methods*, in a 16-page pamphlet entitled "Federal Highway Aid:: What It Saves for the American Taxpayer." The tangible and substantial values of Federal Aid to highways, in the establishment of highway engineering on a scientific and business, rather than a political, basis, are vigorously set forth in an account of conditions before Federal Aid, and since; and the principles involved in the administration of the Federal funds in assisting state highway departments are outlined, with a summary of the work accomplished and of the huge job still ahead. It is shown to be essential that Federal Aid to highways should continue to be actively supported. (Apply to the author, 330 W. 42d St., New York.)

Reports

The Vermont State Chamber of Commerce has prepared a 4-page folder, "Making Town, Village, City Reports More Interesting," in the "hope that these graphs, bar charts and drawings borrowed from the annual reports of a Vermont town may prove suggestive and helpful." It is Bulletin No. 1 in the Chamber's Campaign for the Promotion of the Study of Local Finances. (Apply to the Chamber, Springfield, Vt.)

Municipal "Economy"

In the January, 1933, issue of *The Municipality*, published by the League of Wisconsin Municipalities, in Madison, Wis., appears the paper entitled "Are Local Expenditures Excessive?" which Harold S. Buttenheim, Editor of THE AMERICAN CITY, presented, on December 5, 1932, before the New York University Conference on Taxation, Readjustment of Governmental Expenditures and Problems of Public Credit. While insisting that every effort should be made to eliminate waste, graft and inefficiency in government, the author shows the great value received by the average citizen of the United States in 1930 for the sum of $47.82 paid by him for the support of his local government, including schools, and that the tax money which finances our public business is "not sterilized, but highly productive." He affirms that the same rules as to reduction in time of unemployment cannot be applied to both private and public expenditures, "when increased activity is required in almost all of the local government departments and the necessity of relieving distress increases by leaps and bounds." Reckless cutting of essential services and of salaries and wages, without regard to efficiency and safety, is deplored, and the justice of assessing the costs of government with due consideration of benefits received and ability to pay—as in "a wholesome blend of income, inheritance and land-value taxes" rather than by a general sales tax—is maintained. This article appears also in *The Kentucky City* (Lexington, Ky.), Dec. 17, 1932. (A limited number of copies available upon application to THE AMERICAN CITY, 470 Fourth Ave., New York.)

Water Works

A compilation in tabular form of certain general statistics of the water works for all California cities, towns and sanitary districts, based on surveys from 1930 to 1933, is available as a black line print, on special request to the Bureau of Sanitary Engineering, 3093 Life Sciences Bldg., Berkeley, Calif. 42 pp. 319 communities. The tabulation gives the following: name of governmental unit; date of survey; owner of supply; thumbnail sketch of system and main works; auxiliary supplies; number of taps; population; use of meters; range of consumption; hardness; alkalinity; chlorides; and sulphates (usually for the hardest and softest sources, and seldom by averages). (Send to the Bureau check or money order for $2.75, made payable to the East Bay Blueprint and Supply Co., or any other blueprinting company in Oakland, Calif., that will agree to return the manuscript to the Bureau. Do *not* make remittance in favor of the Bureau.)

Distribution of Buying Power

An address by David Cushman Coyle on "New Aspects of the Distribution Problem" has been revised and reprinted from *The Annals* of the American Academy of Political and Social Science of January, 1933, in a 24-page pocket-size pamphlet. Stable prosperity is shown to be dependent on the continuous distribution of buying power, and this on the diversion of money from unnecessary capital investment into the market for services; and the enlargement of the market for services, in turn, on the education of public opinion toward an expanded program of public expenditure. Single copies, 10c; 20 copies, $1.00; 100 copies, $4.00. (Apply to Mr. Coyle, 101 Park Ave., New York.)

Town and Country Planning

Town and Countryside: Some Aspects of Urban and Rural Development.—By Thomas Sharp. Oxford University Press, London, England. 1932. *XII* + 227 *pp. Many photographs and plans.* $4.50 *from* THE AMERICAN CITY.

The damaging of the English landscape, "the most humanized in the world," through the failure of urban design and the consequent desire of the population to escape from that failure, a desire easily gratified by present transport facilities, has stirred the author of this book to indignation. "To know a quiet, unspoiled place is to hold a quivering secret in one's heart." "There is the town. There is the country. . . . What profit is there in destroying two antithetical types of beauty for something half-way between them?" The book could be reviewed at length in quotations—ardent, graphic, scathing, straightforward, constructive. "Howard's . . . garden-cities are anachronisms. . . . the countryside is at the doorstep of the town, . . . " "It is impossible to convey the sense of frustration that present town-planning arouses in those who know it in its working and who care for beauty or even for mere order and efficiency." "This Town and Country Planning Bill [1932] *may* be a workable instrument for the preservation of the countryside and for landscape design; but its powers will need to be wielded by different authorities from those to whom they are at present entrusted." The analysis of things that are as they should *not* be is not merely critical but is made the basis for detailed presentation of things as the author visualizes them in his solution of the inseparable problems of town and country.

Parks

The American Civic Association's Park Primer, "What Everybody Should Know About Parks," a compilation of valuable park data, has been reprinted from the 1932 American Civic Annual as a bulletin of 15 pp. (Apply to The Association, 901 Union Trust Bldg., Washington, D. C.)

City Manager Plan

The 1933 "City Manager Yearbook" is of importance to every city manager and mayor, to department heads, municipal research bureaus, librarians, students, and other citizens interested in municipal government. Besides the Proceedings of the 1932 Conference of The International City Managers' Association, the complete alphabetical and membership roster of the Association, the Official Directory of City Managers (date of adoption of plan, number of managers each city has had, name and date of appointment of each manager), the progress of council-manager government in 1932, with a résumé for the last ten years, it includes articles by outstanding authorities on various departments of municipal government and administration—budget making, finance, police organization and work, fire prevention, public works, managerial relations with council, municipal utilities, public health, city planning and zoning, playgrounds and recreation, showing significant events and developments in 1932. 300 pp. $2.00, postpaid. (Apply to the Association, 923 E. 60th St., Chicago, Ill.)

The London County Council

The London County Council from Within: Forty Years' Official Recollections.—By Sir Harry Haward, Late Comptroller of the London County Council, and Electricity Commissioner (1920-1930). *Chapman & Hall, Ltd., London, England.* 1932. *XII* + 437 *pp. Illustrated.* 21 *shillings.*

The London County Council became, in 1889, the successor to the Metropolitan Board of Works, in the service of which the author of this book had then already spent a number of years. He draws an interesting contrast between the appearance and facilities of London then and now, and presents interesting and sympathetic portraits of the public personalities he has been in contact with through all these years. He shows how the Council is organized and operates, and devotes a number of chapters to the financial administration, in readable detail. The important services of street improvements, housing, education, and tramways are presented in separate chapters, mainly from the financial point of view. There is an important section on The Council and Public Utility Undertakings, covering the water companies, the gas companies, the port and docks, the electricity supply, the telephones, and the railways. The summary in the closing chapter, General Reflections, is of particular interest.

Public Works

"Proceedings of the Thirteenth Annual Conference of the International Association of Public Works Officials," in Pittsburgh, Pa., Sept. 29-Oct. 1, 1932. 71 pp. Covering addresses and reports on garbage collection, waste incineration, street cleaning, planning of public works, public cleansing in European cities, city accounting and purchasing, sewer maintenance, dust prevention, the care of municipal equipment, and unemployment. (Apply to the Association, 100 N. La Salle St., Chicago, Ill.)

Roadside Problems

The latest number of *The Roadside Bulletin* (Vol. 2, No. 3), published by the American Nature Association (1214 16th St., N. W., Washington, D. C.) for The National Council for Protection of Roadside Beauty (119 E. 19th St., New York), is full of quotable, usable information tending to stimulate the progress of roadside beautification in the United States. This covers not only the fight against advertising by ugly and dangerous billboards, but also clean-ups along the highways, the preservation of beautiful views, sodding and planting of highway borders, the widening and beautifying of intersections, the elimination of auto dumps and wrecking yards, and county control of commercial zones along the open highways. 28 pp. Illustrated. (Apply either to the Association or to the Council.)

Libraries

A 16-page illustrated article on "The Smaller Public Library," by Walter H. Kilham, architect, of Kilham, Hopkins & Greeley, and Robert Coit, Boston, appears in the November issue of *Architecture*. The magazine is 50c a copy. (Apply to Charles Scribner's Sons, Fifth Ave. at 48th St., New York.)

Standard Specifications

In a 24-page pamphlet, "Proposed Changes in Standard Specifications," the American Society of Municipal Engineers recommends the following Tentative Standard Specifications for adoption by the Society: tar macadam pavement; modified asphalt macadam pavement; modified tar macadam pavement; and asphaltic concrete pavement (cold laid type). (Apply to the Society, Engineers' Club Bldg., 4359 Lindell Blvd., St. Louis, Mo.)

Municipal Liability

The *Virginia Law Review* for December, 1932, contained an article by Charles W. Tooke, of New York University, on "The Extension of Municipal Liability in Tort," which has been reprinted in a 24-page pamphlet. So much of human interest is involved in the matter of limiting the immunity of municipal corporations by the distinction between their "governmental" and their "proprietary" functions that this clear exposition attracts the general reader. The absurd and unjust results that often arise from applying this principle of differentiation are described and illustrated. Attempts to adjust the law to our ideas of social justice are stated and the difficulties in securing reform are explained. "It is apparent . . . that future progress will be by piecemeal legislation, covering specific acts of official negligence; that even to this extent the reform movement is bound to be handicapped by the opposition of the local officials; . . . " (Apply to the author, New York University, New York City.)

Public Employment

Further Contributions to the Prestige Value of Public Employment.—By Leonard D. White, Ph.D. The University of Chicago Press, Chicago, Ill. 1932. *XVIII* + 88 *pp. Tables, graphs.* $1.50 *from* THE AMERICAN CITY.

This is Number XXIV of the Social Science Studies directed by the Social Science Research Committee of the University of Chicago, and is an extension of the author's previous investigation, which was limited to Chicago's municipal service. What impression of the worth and standing of city employees have different classes of people? If the prestige of city employment is low, it will be difficult to secure and to retain well-qualified men and women in public service. This volume makes a general inquiry and considers the relative prestige standing of city, state, and Federal employment, as understood by different groups according to sex, age, education, occupation, race and nationality. The forms and methods used are given in detail, and the results summarized and interpreted. "The public service needs its fair share of the very finest ability."

City Planning

"The Planning of a City" is a chapter by Frederic H. Fay, Chairman of the Boston City Planning Board, reprinted from the Memorial Volume, "Fifty Years of Boston," published by the Sub-Committee on Memorial History of the Boston Tercentenary Committee. Miss Elizabeth M. Herlihy, Secretary of the City Planning Board, is editor of the book (799 pp.; $5.00). An interesting account of the city planning events that have taken place in the community since the settlement of the city. The section on the development of zoning is of particular importance. Boston was the first city in the United States to secure the enactment of a comprehensive heights of building law. 20 pp. (Apply to the City Planning Board, 30 City Hall, Boston, Mass.)

Traffic

In a pamphlet of 55 pages entitled "Uniform Traffic Laws" the National Conference on Street and Highway Safety presents the salient features of the Uniform Vehicle Code recommended by the Conference as a standard for the regulation of street and highway traffic. State officials will find herein a convenient means of checking these provisions against their present state laws and determining what changes are needed to make those laws meet present standards of safety. The importance of uniformity in the essential provisions of motor-vehicle laws is made convincingly evident. (Apply to the Conference, 1615 H St., N. W., Washington, D. C.)

Taxation

Tax subjects are discussed in two reprints and two mimeographed papers by John W. Martin, Director, Bureau of Business Research, University of Kentucky, which are available for distribution by the Bureau. The articles are "Operation of the Real Estate Tax in Lexington, Kentucky (12 pp.), by Mr. Martin and George W. Patton, and "Organized Tax Research in the United States and Canada" (6 pp.), written in collaboration with C. M. Stephenson and Margaret Bargar; the articles are reprinted from *The Tax Magazine* for July-August and October, respectively. "Selective-Excise and General-Sales Taxes as Sources of State-and-Local Revenue" (26 pp.) and "Possibilities of Income Taxes as Sources of State and Local Revenue" (22 pp.) are the titles of the papers. (Apply to the Bureau, University of Kentucky, Lexington, Ky.)

Public Reports

The Committee on Uniform Street and Sanitation Records (923 E. 60th St., Chicago, Ill.) has published a guide for public works officials in preparing annual reports which shall compel the interest of the citizens and convince them that the city affairs are well managed. Its title is: "How to Prepare an Annual Public Works Report." By using the Committee's system of compiling and analyzing work done and its cost, officials may obtain better results for the money spent, may know which equipment and methods are the most effective and the cheapest. 31 pp. Photographs, charts, tables. (Apply to the Committee.)

Water Supply

"What We Are Doing in Water Resources" is a 20-page reprint from the Biennial Report of the Division of Water Resources and Engineering of the Department of Conservation and Development of the State of North Carolina, for the biennium ending June 30, 1932. Photographs, map, tables. "North Carolina is the only Southern state which has created an engineering agency charged with the investigation and conservation of all phases of its water resources." To evaluate the diverse uses of water "in order that the state may wisely and to the best advantage plan an orderly and sound program of public welfare and industrial development requires the collection of fundamental engineering and scientific data over a period of years." Such is the prime objective of the Division, which has been working since the summer of 1920. (Apply to the Division, Raleigh, N. C.)

Highway Finance

"Administrative and Financial Relationship of State and County (Methods of State Aid Extension)" and "Methods of Promoting County Bond Issues" are presented in American Road Builders' Association Bulletin No. 31. 51 pp. It is stated that "the county as a highway administrative and financing unit has a definite place in the development of a national highway system. Its strength is greatest in states where it has been in close cooperation with the state. Efficiency and effectiveness has been increased in these counties by state aid, which has stimulated greater expenditure of county funds." There is much practical and illustrative material in the study of methods of promoting county bond issues. (Apply to the Association, National Press Bldg., Washington, D. C.)

County Government

"Oakland County—A Survey of County and Township Administration and Finance," by Thomas H. Reed, Professor of Political Science and Director of the Bureau of Government, University of Michigan, and associates, was made to get a non-political, unbiased survey of the county affairs. A number of recommendations for improving the form of county government and its administration are included. 113 pp. (Apply to A. R. Glancey, Bloomfield Hills, Mich.)

Gasoline Tax

Of timely interest is the third edition of "The Administration of the Gasoline Tax in the United States," by F. G. Crawford, Professor of Political Science, School of Citizenship and Public Affairs, Syracuse University. 66 pp. 50c. Apply to the Municipal Administration Service, 309 E. 34th St., New York.)

Taxation

In its report for the year 1932 the New York Tax Reform Association includes, with other material showing the purpose of the Association to develop state-wide public opinion in support of sound revenue measures and economical public administration, brief statements of the scope and policies of the following like-minded organizations: National Tax Association; New York State Economic Council, Inc.; American Taxpayers League; National Economy League; League of Women Voters; General Welfare Tax League. (Apply to Gladwin Bouton, Sec., New York Tax Reform Assn., 302 E. 35th St., New York.)

Scrip and Tokens in Place of Money

"Making Money" is the title of an article by Jacob Baker in the February issue of the *Survey Graphic*. It gives the 200-year history of several devices for conveniently exchanging labor for commodities when money is scarce, and tells why some of these failed. It shows that the credit token alone will not make mutual enterprise successful, but that enthusiasm and efficiency may. 50c a copy. (Apply to the magazine, 112 E. 19th St., New York.)

School Lighting

"Standards of School Lighting, with Suggested Requirements for a School Lighting Code," is the title of a 39-page well-illustrated pamphlet presenting a revision of the Code of Lighting School Buildings prepared under the joint sponsorship of the Illuminating Engineering Society and the American Institute of Architects. The revision has been approved (Sept. 15, 1932) as an American Standard by the American Standards Association. To make pupils and teachers efficient and free from strain in their school work, by the conservation of vision through good illumination, is the purpose of this study and its recommendations, for the guidance of architects, engineers, school officials and others concerned in the design, arrangement and use of school buildings. (Apply to THE AMERICAN CITY, 470 Fourth Ave., New York.)

Housing

Some references to current material on housing, recently received by the Municipal Reference Bureau, 244 City Hall, Cincinnati, Ohio, are listed on 3 mimeographed sheets. Dec., 1932. (Apply to the Bureau.)

Other Reports Received

BERKELEY, CALIF.—Annual Report of the City Manager, for the fiscal year ending June 30, 1932. 81 pp.

CHICAGO, ILL.—Report on "The Financial Difficulties and Conditions of the Local Governments in Cook County," presented to the Commercial Club of Chicago by the Chicago Committee on Public Expenditures. 1932. 40 pp.

DES MOINES, IOWA.—Zoning Ordinance, as amended to November, 1932. 40 pp. and map.

GARDEN CITY, N. Y.—Report of the Survey Committee organized to study the activities of the Incorporated Village of Garden City, 1932. 39 pp.

LOS ANGELES, CALIF.—Annual Reports, Boards of City Planning Commissioners, and Public Works, July, 1931-June, 1932. 17 and 159 pp.

MONROE COUNTY, N. Y.—Report of the Monroe County Regional Planning Board, 1932. 20 pp., mimeographed.

ST. LOUIS, MO.—Annual Report of the Water Commissioner, for the year ending April 11, 1932. 264 pp.

CONVENTIONS—WHEN AND WHERE

(Figures in parentheses following the name of the convention city indicate the estimated attendance other than local)

FEBRUARY 7-8.—OTTAWA, ONT. (250)
Engineering Institute of Canada. Annual meeting. Secretary, R. J. Durley, 2050 Mansfield Street, Montreal, Que.

FEBRUARY 9-11.—LOUISVILLE, KY. (100)
American Water Works Association—Kentucky-Tennessee Section. Annual meeting. Executive Secretary, F. C. Dugan, 532 West Main Street, Louisville, Ky.

FEBRUARY 9.—BOSTON, MASS. (125)
Massachusetts Highway Association. Secretary, John M. McCarthy, 318 State House, Boston, Mass.

FEBRUARY 9.—HARRISBURG, PA.
Pennsylvania State Chamber of Commerce. Annual meeting. General Secretary, George E. Foss, Harrisburg, Pa.

FEBRUARY 14-16.—ANN ARBOR, MICH. (700)
Conference on Highway Engineering—University of Michigan. Annual convention. Secretary, R. E. Morrison, University of Michigan, Ann Arbor, Mich.

FEBRUARY 15-17.—ATLANTIC CITY, N. J. (1,500)
Association of Highway Officials of North Atlantic States. Annual convention. Secretary, A. Lee Grover, State Highway Commission of New Jersey, Trenton, N. J.

FEBRUARY 20-23.—CHICAGO, ILL. (250)
National School Supply Association. Annual convention. Executive Secretary, J. W. McClinton, 176 West Adams Street, Chicago, Ill.

FEBRUARY 21-24.—CHICAGO, ILL. (350)
American Concrete Institute. Annual convention. Secretary, Harvey Whipple, 641 New Center Building, Detroit, Mich.

FEBRUARY 21-22.—HARTFORD, CONN. (900)
Connecticut Society of Civil Engineers. Annual meeting. Secretary, H. J. Tippet, Box 235, New Haven, Conn.

FEBRUARY 21-24.—WICHITA, KANS.
Southwest Road Show and School. Annual Show and School. Manager, F. G. Wieland, Exposition Building, Water and Williams Streets, Wichita, Kans.

FEBRUARY 22-23.—TORONTO, ONT. (600)
Ontario Good Roads Association. Annual convention. Write: S. L. Squire, 98 Albany Avenue, Toronto, Ont.

FEBRUARY 25-MARCH 2.—MINNEAPOLIS, MINN. (10,000)
National Education Association—Department of Superintendence. Annual meeting. Executive Secretary, Sherwood D. Shankland, 1201 16th Street, N. W., Washington, D. C.

FEBRUARY 27-28.—TORONTO, ONT. (50)
American Concrete Pipe Association. Annual convention. Secretary, M. W. Loving, 33 West Grand Avenue, Chicago, Ill.

MARCH 1-3.—SASKATCHEWAN, SASK. (800)
Saskatchewan Association of Rural Municipalities. Annual convention. Secretary, J. J. McGurran, 407 Kerr Building, Regina, Sask.

MARCH 8.—BOSTON, MASS.
American Water Works Association—New England Section. Annual meeting. Secretary-Treasurer, Roger W. Esty, Superintendent of Water Department, 17 Hobart Street, Danvers, Mass.

MARCH 22-24.—OTTAWA, ONT. (300)
American Water Works Association—Canadian Section. Annual meeting. Secretary-Treasurer, Dr. A. E. Berry, Director of Sanitary Engineering, Province of Ontario, Parliament Buildings, Toronto, 5, Ont.

MARCH 23-24.—TRENTON, N. J. (200)
New Jersey Sewage Works Association. Annual meeting. Secretary, John R. Downes, Bound Brook, N. J.

MARCH 28-29.—FORT WAYNE, IND. (175)
American Water Works Association—Indiana Section. Annual meeting. Secretary-Treasurer, C. K. Calvert, 1902 North New Jersey Street, Indianapolis, Ind.

APRIL 4-6.—ALBANY, GA. (250)
American Water Works Association—Southeastern Section. Annual meeting. Secretary-Treasurer, W. H. Weir, 4 Capitol Square, S. W., Atlanta, Ga.

APRIL 7-8.—PHILADELPHIA, PA. (250)
American Academy of Political and Social Science. Annual meeting. Secretary, J. P. Lichtenberger, 3457 Walnut Street, West Philadelphia, Pa.

APRIL 10.—NEW YORK. (350)
National Committee on Prisons and Prison Labor. Annual meeting. Secretary, Julia K. Jaffray, 250 West 57th Street, New York.

APRIL 13-15.—GAINESVILLE, FLA. (150)
Florida Engineering Society. Annual meeting. Secretary, W. W. Fineren, Gainesville, Fla.

APRIL 21-22.—HAVRE, MONT. (50)
American Water Works Association—Montana Section. Annual meeting. Secretary, Herbert B. Foote, State Board of Health, Helena, Mont.

APRIL 23-28.—STILLWATER, OKLA.
Oklahoma Water and Sewage Conference. Annual conference. Secretary-Treasurer, H. J. Darcy, State Sanitary Engineer, Oklahoma City, Okla.

APRIL 24-27.—WASHINGTON, D. C. (1,100)
American Red Cross. Annual convention. Secretary, Mabel T. Boardman, National Headquarters, Washington, D. C.

APRIL 24-25.—BOSTON, MASS. (500)
Massachusetts Safety Conference. Secretary, Lewis E. MacBrayne, 6 Beacon Street, Boston, Mass.

APRIL 27-29.—RALEIGH, N. C. (85)
Southern Commercial Secretaries' Association. Annual meeting. Secretary-Treasurer, Charles Ketchum, Greensboro, N. C.

APRIL 29-MAY 1.—RALEIGH, N. C.
North Carolina Commercial Secretaries Association. Annual meeting. Secretary, Howard B. Branch, Chamber of Commerce, Raleigh, N. C.

MAY 2-5.—WASHINGTON, D. C.
Chamber of Commerce of the United States. Annual meeting. Secretary, D. A. Skinner, 1615 H Street, N. W., Washington, D. C.

MAY 4-5.—BALTIMORE, MD. (75)
Maryland-Delaware Water and Sewerage Association. Annual conference. Secretary, A. W. Blohm, 2411 North Charles Street, Baltimore, Md.

JUNE 12-16.—CHICAGO, ILL. (1,200)
American Water Works Association. Annual convention. Secretary, Beekman C. Little, 29 West 39th Street, New York.

JUNE 13-15.—CINCINNATI, OHIO.
Municipal Finance Officers' Association of the United States and Canada. Annual meeting. Executive Director, Carl H. Chatters, 850 East 58th Street, Chicago, Ill.

JUNE 26-30.—CHICAGO, ILL.
American Institute of Electrical Engineers. Annual summer convention. Assistant National Secretary, H. H. Henline, 33 West 39th Street, New York.

JUNE 26-30.—CHICAGO, ILL.
American Society for Testing Materials. Annual meeting. Secretary-Treasurer, C. L. Warwick, 1315 Spruce Street, Philadelphia, Pa.

JULY 31-AUGUST 3.—CHICAGO, ILL. (700)
International Association of Chiefs of Police. Annual convention. Secretary, George Black, Chief of Police, Wilmington, Del.

SEPTEMBER 7-8.—NEW YORK.
National Shade Tree Conference. Annual convention. Secretary-Treasurer, Dr. Rush P. Marshall, Yale University, New Haven, Conn.

SEPTEMBER 21-23.—MILWAUKEE, WIS.
International Association of Public Works Officials. Annual convention. Secretary, A. M. Anderson, 100 North LaSalle Street, Chicago, Ill.

SEPTEMBER 26-28.—WILKES-BARRE, PA.
International Association of Municipal Electricians. Annual convention. Secretary, W. H. Harth, Columbia, S. C.

OCTOBER 2-6.—ATLANTIC CITY, N. J.
National Recreation Association. Annual congress. Administrative Secretary, Thomas E. Rivers, 315 Fourth Avenue, New York.

OCTOBER 2-6.—CHICAGO, ILL. (3,000)
National Safety Council. Annual congress. Managing Director, W. H. Cameron, 20 North Wacker Drive, Chicago, Ill.

NOVEMBER 6-8.—STATESVILLE, N. C.
American Water Works Association—North Carolina Section. Annual meeting. Secretary-Treasurer, Professor H. G. Baity, University of North Carolina, Chapel Hill, N. C.

NEWS AND ILLUSTRATIONS

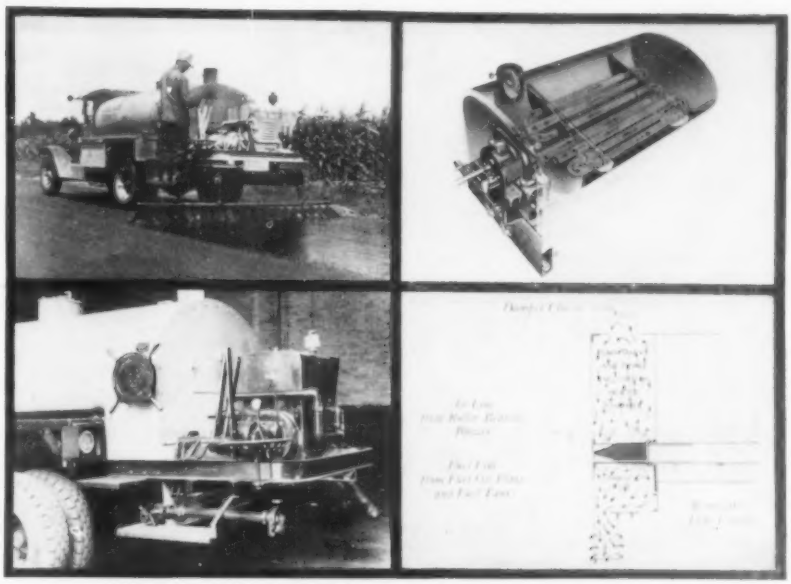
Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

A Mobile Asphalt Plant

Mobile asphalt plants consisting of three units, the mixing unit, the asphalt heating unit and the boiler unit, designed by the Madsen Iron Works, Los Angeles, Calif., are now manufactured by the Blaw-Knox Co., Pittsburgh, Pa., for sale in territories in the United States east of the Rocky Mountains and in countries outside of the United States of America. These plants prepare and mix the material for all types of asphalt, bituminous concrete, oil mix and cold-laid pavements. The entire plant is fully portable and is transported on a set of wheels interchangeable between the three units, furnished as standard equipment.

Each of the three units is so designed that the frame members act as the chassis on which they are moved. This design allows the permanent mounting and alignment of all operating parts and obviates the time-consuming tearing-down and subsequent assemblies. The mixing unit proper comprises the general assembly of the elevator, dryer and screen, aggregate bin, aggregate weigh box, asphalt-weighing equipment, twin-shaft pug-mill mixer, and electric power drive. For diesel or gasoline engine drive the power unit is separate. At each of the four corners of the upper platform a ratchet-operated jack is built in. The dryer-screen and mixer units are raised or lowered on the corner columns by operating these jacks. Thus these heavy units are easily handled, raised or lowered without necessity for a crane or other hoist.

The asphalt heating unit is of sufficient capacity to insure a continuous supply of hot bituminous material under any present specification. The heating unit comprises equipment which is modern and unique in design. The boiler is constructed in accordance with A.S.M.E. specifications for a working pressure of 150 pounds and is permanently mounted on a steel frame, on which it is operated and transported. It is thoroughly insulated and completely equipped.



THE LITTLEFORD ASPHALT DISTRIBUTOR, SHOWING CONSTRUCTION AND OPERATION

A feature of the Madsen Blaw-Knox asphalt plant is the asphalt gun. This is a steam-ram-operated injector which forces a weighed quantity of asphalt cement into the mixer when the operator moves the control valve.

The plant is completely operated by three men, one of whom controls the mixer and other plant functions including the aggregate gate levers, the weigh-box discharge, the charging of the bituminous oil, the mixer discharge and other functions at the plant proper. The fireman, in addition to tending the boiler, supervises the heating of asphalt and the transfer of asphalt from delivery trucks or storage to the heating unit. The handy-man oiler also acts as relief mixer man and tends the dryer and screen unit on the top platform.

The mobility of this plant is clearly indicated through a recent report received by the manufacturers from a prominent contractor in Minnesota. This contractor moved his entire plant 65 miles, beginning his dismantling on Friday morning, and on the Monday following, at noon, was actually mixing materials for the new contract.

A TYPICAL MADSEN BLAW-KNOX MOBILE ASPHALT PLANT

A Sewage Screenings Incinerator

The Morse Boulger Destructor Co., 205 East 42nd Street, New York, has recently received a contract for the erection of a sewage screenings incinerator for the city of Los Angeles, Calif. This plant will be located adjacent to the North Hyperion screenings plant, which is the largest plant of its type in the world. The specifications issued by the city of Los Angeles called for a plant to dispose of 50 tons of fine screenings per day, the screenings to be from 85 to 90 per cent moisture content. The design was left entirely to the bidders, and experience in this particular class of work was one of the important factors in awarding the contract.

The plant accepted by the city provides for the dewatering of the screenings to approximately 70 per cent moisture content. A standard Morse Boulger screenings destructor of the type now in use in a number of plants throughout the country will be used for the incineration of the dewatered screenings. Construction will be started immediately and the plant should be in operation in about four months.

Notable installations made in the sewage field by the Morse Boulger Destructor Co. during the last several years include two 20-ton-per-day destructors for the Milwaukee Sewerage Commission, and three 24-ton-per-day destructors for the Westchester County Sanitary Sewer Commission, White Plains, N. Y. A number of small destructors ranging in capacity from 65 pounds per hour up, have also been installed at various plants in different parts of the country.

IF METAL PIPE IS USED

IF LOCK JOINT PIPE IS USED

WHY Not GIVE Your Own TAX-PAYERS and Your Own Customers the BENEFIT of Your PIPE-LINE DOLLARS ?

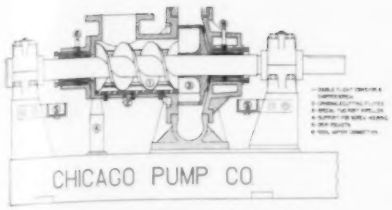
LOCK JOINT PIPE will help your unemployment situation by giving Work to a larger number of men in Your Community than any other kind of pipe, because it will be Manufactured in Your City and Purchases of Materials will be made from Your Merchants and money for the purchase of the Pipe will Remain in Your Banks instead of being sent to other cities. All of this means that the Water Department is Helping the Community and thereby Helping its Customers and therefore Helping Itself.

The uniformity of Excellent Performance over a period of years has established LOCK JOINT REINFORCED CONCRETE PIPE in the very Front Ranks of large pipe line material.

Lock Joint Pipe Co., Ampere, N. J.
PRESSURE: SEWER: CULVERT: SUBAQUEOUS

LOCK JOINT
Reinforced Concrete
PRESSURE PIPE

Has ALWAYS *Been* GOOD – *But It Is* BETTER THAN EVER *In These Days*



THE NEW CHICAGO SCREW-FEED CENTRIFUGAL PUMP FOR HANDLING PRIMARY SLUDGE

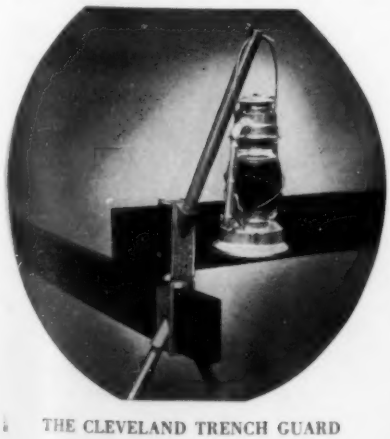
A Screw-Feed Centrifugal Pump

A new idea for the pumping of heavy sludge in sewage disposal plants has been developed by the Chicago Pump Co., 2336 Wolfram Street, Chicago, Ill. A screw-feed centrifugal pump has been especially designed for handling primary sludge. The sludge is carried to the pump by a conveyor and cutting screw. The screw is a double-flight type, and each passage in the screw connects with its own port in the impellor. In the screw housing are four hardened flutes. These flutes assist in guiding the sludge to the impeller and provide a cutting edge for the solids. Thus, the screw-feed design directs all articles through the pump in a continuous stream line. It also breaks and cuts up anything that would otherwise be impossible to handle.

Very thick primary sludge can be handled without dilution. The pump will not clog when the sludge is extra heavy or when it contains a high percentage of large solid or screening material. The first cost is low, hardly more than that of a standard centrifugal pump. The manufacturers state that maintenance and installation costs are much lower than ordinary non-clog pumps, air ejectors, or diaphragm or plunger type units. The screw-feed centrifugal pump can handle rags, heavy sacks, rope and other similar materials, which is more important than the usual specification of "passing of a given sized sphere."

A Practical Trench Guard

A trench guard made of rust-proof malleable iron with galvanized pipe legs for holding 2 x 4 commercial lumber has been announced by the Cleveland Trencher Co., 20100 St. Clair Avenue, Cleveland, Ohio. One complete trench guard consists of a pair of swiveling guard-rail holders, of malleable iron, two galvanized ¾-inch supporting pipes, threaded, one galvanized ¾-inch supporting pipe for use as a flag or lantern support, this being threaded, drilled and notched, and one red flag, eyeletted. By the use of these swiveled guard-rail holders barricades which maintain an unbroken fence regardless of the shape of excavation may be built up and run along any irregular trench. The guard-rails are held at different heights and thus attract greater attention. The threaded galvanized pipe support for lanterns or flags is drilled at the top for the insertion of a nail or pin, thus minimizing the loss or theft of lanterns and flags. It holds the danger signal in view from every direction. They are not readily blown over or removed and are sufficiently visible to motorists.



THE CLEVELAND TRENCH GUARD

Special Department for Sale of Chemical Castings

The Lynchburg Foundry Co., Lynchburg, Va., which owns and operates two plants in Virginia for the manufacture of cast iron pipe and fittings, has announced the creation of an entirely new department for the manufacture and sale of chemical castings. A new iron, copyrighted as "Lyncast," has been developed which is peculiarly satisfactory for chemical work. The new department, of which R. N. Stubbs, Jr., has been appointed Sales Manager, is known as the Chemical Castings Division of the Lynchburg Foundry Co. Mr. Stubbs, who is a new member of the Lynchburg organization, has been connected with The Hammond Iron Co., of Birmingham, Ala., for the last nine years in a sales capacity. He is a graduate of the School of Mines at the University of Missouri, as a Metallurgical Engineer, and has had considerable practical metallurgical experience, making him peculiarly fitted to serve the trade in this class of work.

This organization also announces the appointment of W. Ray Odor as Assistant Sales Manager in the Pipe Sales Department. Mr. Odor has been employed by The Lynchburg Foundry Co. for the past fifteen years in various departments, having been in the Pipe Sales Department for the past seven years. With this background of actual experience and close contact with company policies, Mr. Odor is well fitted to assist John T. Woodson, Sales Manager, in serving the cast iron pipe and fitting trade.

The entire sales organization of The Lynchburg Foundry Co., consisting of John T. Woodson, Sales Manager, and W. R. Odor, Assistant Sales Manager, in the Pipe Sales Department; O. H. Smith, Sales Manager, and R. W. Wingfield, Assistant Sales Manager, in the Plow Sales Department; the Chicago sales office in charge of J. A. Sullivan; the New York sales office in charge of S. L. Kelly; and the Chemical Castings Division in charge of R. N. Stubbs, Jr., Sales Manager, is under the personal supervision of Garland R. Johnson, Vice-President in charge of sales.

Reversible Blade Snow-Plows

General purpose speed plows for mounting on motor trucks for snow removal have been announced by the Monarch Manufacturing Co., Inc., East Front Street, Wilmington, Del. These Monarch reversible blade snow-plows have simple axle clamps making a direct connection to the front axle of the truck. On certain makes of light truck equipment, owing to the peculiar front axle construction, the use of axle clamps is prohibited, so provision is made for such attachments by the use of the Monarch under-frame which attaches rigidly to the chassis frame of the truck and is supported by the front axle. The moldboard of the plow is free of any protruding bolt or rivet heads, thus presenting a smooth surface to which the snow does not stick. It is suitably curved to induce free rolling of the snow towards the discharge end. Heavy longitudinal and vertical braces further augment the rigidity of the moldboard. Flare plates for attaching to either end of the moldboard are furnished at slight extra cost. They considerably increase the height of the blade at the discharge end. The edge which is attached to the lower part of the plow moldboard is of abrasion-resisting steel of high quality, especially selected for this work. The swiveling caster wheels of the plow are made of hardened steel and equipped with anti-friction bearings and Alemite fittings.

A release arrangement automatically provides for safeguarding the plow against damage when coming in contact with surface obstructions. It is sufficiently rigid for all plowing requirements but instantly releases the blade when it is brought in contact with any fixed obstruction. The semicircle on the Monarch snow-plow is located *above* the push frame. This permits caster wheels of greater diameter, and ample clearance for the casters, with the caster stem housings more rigidly supported. The lifting device for the plow is an enclosed self-locking worm and worm-wheel operating in an oil bath and equipped with anti-friction bearings. It is supported by upright steel legs, fully adjustable to width and height, thus making it attachable to any truck. It is operated through a telescopic hand wheel shaft and auto type hand wheel.

Results of Municipal Ownership of Water Works

A wealth of statistical and other information on municipally owned water works in the United States is available in a 56-page booklet compiled by R. E. McDonnell, of the Burns & McDonnell Engineering Co. Operating results of 100 municipal water works, and the charges for various quantities of water in the case of 225 municipally and 25 privately owned systems, are included in the financial data; and there is much valuable textual matter relating to various aspects of municipal water supply. Copies may be had for $1 each from THE AMERICAN CITY.

Miracle Worker, AGE 8

His little hands hold the instrument tightly; his small, confident voice speaks eagerly into the mouthpiece. And as simply as that, he talks to his friend who lives around the corner, or to his Granny in a distant city . . . achievements which, not so many years ago, would have seemed miraculous.

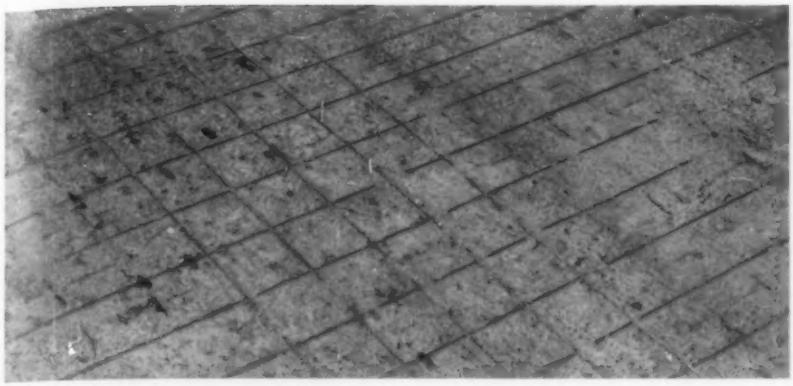
These miracles he takes as a matter of course, in the stride of his carefree days. You yourself probably accept the telephone just as casually. Seldom do you realize what extraordinary powers it gives you. You use it daily for a dozen different purposes. For friendly chats. For business calls. To save steps, time and trouble. To be many places, do many things, visit many people, without so much as moving from the living room of your home or the desk in your office.

At this very moment, somewhere, your voice would be the most welcome music in the world. Some one would find happiness in knowing where you are and how you are. Some one would say gratefully, sincerely—"I was wishing you'd call."

From among more than seventeen million telephones in this country, the very one you want will be connected quickly and efficiently with the telephone in your home or office.

Your telephone is the modern miracle which permits you to range where you will—talk with whom you will. It is yours to use at any hour of the day or night.

AMERICAN TELEPHONE AND TELEGRAPH COMPANY



CONDITION OF THE CONCRETE FLOOR OF THE BULL CREEK BRIDGE

Proof of Permanence of Concrete and Steel Construction on Bridge Slabs

The question has been raised as to the possibility of the "cupping" of concrete on bridge floors of the T-Tri-Lok type produced by the Carnegie Steel Co., Pittsburgh, Pa. Evidence to the contrary is presented in the case of the Bull Creek Bridge erected by Allegheny County, Pa., in September, 1930. This was one of the first installations of T-Tri-Lok construction. The bridge is located on the Bull Creek Road, a heavily traveled highway between Tarentum and Culmerville, Pa. Heavily loaded coal trucks use the road constantly, subjecting it to the hardest type of service. The bridge is on a curve and superelevated, thus adding a further element of wear. The illustration shows the condition of the roadway in the third year of service. It will be seen that no cupping has developed between the exposed edges of the steel, notwithstanding the difference in hardness between steel and concrete. Attention is also directed to the fact that at certain places on this bridge floor when the concrete was floated off, a thin film approximately ⅛-inch thick, remained on top of the steel, and this film of concrete still remains even though the position on the bridge floor would indicate that it had been subjected to the maximum wear.

Smith Made Advertising Manager of Central Iron & Steel Co.

Central Iron & Steel Co., Harrisburg, Pa., has announced that, effective January 1, 1933, I. M. Smith became advertising manager of the company, with headquarters in the principal offices at Harrisburg, Pa.

An Automatic Chemical Feeder for Sludge Treatment

The Ferr-O-Feeder is a special feeder developed by Proportioneers, 77th and Avalon Avenue, Chicago, Ill., for feeding ferric chloride solution by means of the Tret-O-Motor to sewage sludge, in accurate proportions no matter how wide the variations in rate of flow. The Tret-O-Motor, which is a variable-stroke reagent pump for feeding the ferric chloride, is driven by a belt or rope drive from the variable speed shaft of a Dorrco variable-stroke sludge pump. The chemical pump is of all-rubber construction wherever the ferric chloride comes in contact with the pump, and the number of strokes per minute is controlled by the speed of the sludge pump. The length of stroke is adjustable in small increments while the machine is in motion by means of a micrometer screw. This permits close control of the pH as the flow rate of the sludge varies. It also permits the operators to adjust for changes in sludge quality.

Ferric chloride pumps of this type may have their stroking rate controlled from a flow responsive rotor of a type which Proportioneers has developed for handling sludge employing the control method known as the Tret-O-Rotor. This system of proportional processing is adaptable for water conditioning in municipal water works, for water softening and for feeding any prepared chemical compounds in water supply or sewage treatment, such as soda ash or alum, and for the handling of chlorine solutions.

An Adjustable Leveling Hone

A double purpose tool which can be used either as a hone on maintenance work to plane out ruts and chuckholes and effectively smooth the surface, or can be set to accurately spread material to any desired thickness for the construction of road-mix bituminous surfaces, has been announced by the Perry Equipment Co., Sidney, Ohio. When the Perry adjustable leveling hone is used as a hone, it will plane off excessive crown, distributing the material evenly over the road. Its use straightens the edge of the road and correctly prepares the base for surface treatment without disturbing the bond resulting from traffic compaction, because its action is a honing or planing effect without any scarifying or loosening tendency. The straight-edge effect is accomplished through the correct location of the edging baffle plates which confine the action of the hone within definite limits.

The adjustable feature of the Perry leveling hone permits its use as an accurate spreader of aggregate. Loose material can be spread to any desired depth within practical limits for bituminous surfacing operations. When the machine is set in the desired position, one trip spreads the material to a uniform thickness, ready for the application of the binder material. The accompanying illustration shows the machine in detail.

Welded Branch Connections for Pipes

In new construction or maintenance work welded pipe to pipe intersections frequently produce many disadvantages. The Bonney Forge and Tool Works, Forged Fittings Division, Allentown, Pa., has developed Weldolets and Thredolets specifically designed to overcome these disadvantages. Weldolets are stock welding fittings for making branch connections by welding. Only one weld is required to install a Weldolet on the parent pipe; a second simple Vee weld is used to attach the branch. Thredolets provide a simple method for making threaded branch connections without removing sections of the main pipe. Only one weld is required to install a Thredolet; the branch is then threaded and screwed into position. In this manner the junctions are never obstructed by icicles or oxidized weld metal. The inside of the junction may be readily examined before the branch pipe is installed. No complicated cutting or forming of the main pipe and branch is necessary. These welding fittings are designed to reduce turbulence and friction to a minimum and meet every requirement of good piping practice.

THE PERRY ADJUSTABLE LEVELING HONE

Barrett Tarvia

GOOD ROADS at LOW COST

Route No. 20, Lucas County, Ohio. Tarvia-built, 1927

The Barrett Company

New York	Chicago	Philadelphia
St. Louis	Minneapolis	Boston
Detroit	Cleveland	Hartford
Buffalo	Columbus	Milwaukee
Providence	Syracuse	Birmingham
Lebanon	Toledo	Cincinnati
Baltimore	Youngstown	Bethlehem
Rochester		Portland, Me.

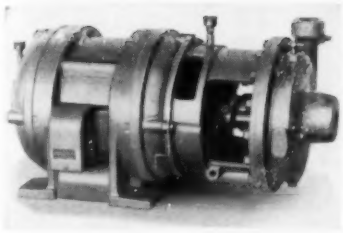
THE BARRETT COMPANY, Ltd.
Montreal Toronto Winnipeg Vancouver

ALL road tars are not alike. There is a striking difference—in favor of Tarvia.

For Tarvia is made only by The Barrett Company, America's oldest and most-experienced manufacturer of coal-tar road-building materials. Barrett has many sources of crudes, and 29 years of manufacturing experience have taught Barrett chemists and engineers how to classify them and refine Tarvia in grades to meet every highway need. The Tarvia Barrett offers to meet users' specifications must first of all meet our own rigid, self-imposed specifications.

The result is a degree of uniformity and dependability in Tarvia which ordinary road tars do not duplicate. Experienced road engineers appreciate the difference because it helps them eliminate "guess-work." With Tarvia, plus the intelligent and unobtrusive advice and cooperation of skilled Tarvia field men, smooth, easy-riding, skid-safe roads are easy to build . . . and easy and economical to maintain.

Before completing your 1933 plans, ask the Tarvia field man to tell you more about the *plus-values* of Tarvia.



ONE OF THE NEW ALLIS-CHALMERS SSU PUMPING UNITS

Addition to Line of Pumping Units

The addition of three sizes of pumping units to the Allis-Chalmers line of SSU motor-driven single-shaft two-bearing pumping units has recently been announced. These pumps work against heads up to 100 pounds and above, and cover a range in capacity from 30 gallons per minute to 140 gallons per minute. A single shaft is used on which to mount the motor rotor and the pump impeller, the shaft being supported by two amply sized ball bearings. The pumps and motors are both made by the Allis-Chalmers Manufacturing Co., Milwaukee, Wis.

New Marking Machine for Traffic Lanes

A marking machine for traffic lanes which involves the use of compressed air has been announced by Spraco, Inc., 113 Central Street, Somerville, Mass. A pneumatically operated gun sprays the line between two circular disc shields, independently attached to the large driving wheels on the four-wheel carriage. The discs can be adjusted to any width of line from 4 to 8 inches. These discs insure a sharp-edged line, the excess paint being collected from the shields by wipers and deposited in the center of the line.

The spray gun is operated by a grip control on the handlebar attached to the carriage, and the other grip control operates a drip pan to catch the paint collected by the wipers when the machine is stopped, or when marking a dot-and-dash line. The compressed air for the spray gun is furnished by a light-weight portable gas-engine-driven compressor unit mounted on rubber-tired wheels, space being provided on the compressor chassis for mounting the pressure feed paint container.

An additional spray gun is regularly furnished with the equipment for stenciling danger signs on the road surface, and aside from the highway marking unit the equipment constitutes a complete portable maintenance painting outfit suitable for all classes of general painting work.

Roller-Bearing Rock Crushers

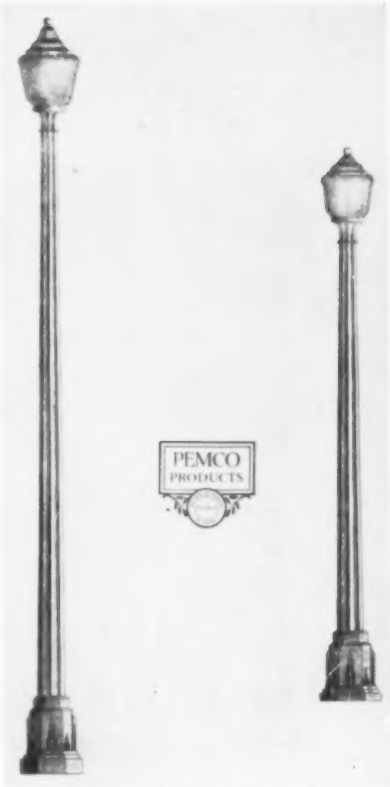
Roller-bearing rock crushers designed and constructed to produce the smallest grades of crushed stone in large quantity and at low cost per ton are made by the Monarch Manufacturing Co., Inc., Wilmington, Del. When used for reduction purposes only, the coarse materials from primary breaker or storage bin are fed direct and automatically to these crushers. The Monco crusher also serves as a dual-purpose machine. Owing to its large feeding mouth, one-man rock may readily be fed to the crusher and reduced in one operation to the smaller grade.

To accomplish the reduction of the hardest rock to small sizes, the machine is built of a specially selected and tested steel with the eccentric shaft and moving jaw equipped with self-aligning roller bearings with long moving stationary jaws. The eccentric shaft is made from high-grade chrome vanadium steel forgings finely machined to accommodate the self-aligning bearings. The ends are tapered corresponding to the tapered bore in the flywheels, which are keyed to the shaft, and a large lock nut tightens against the outer hub face of the flywheel. This construction insures a rigid positive fit, but allows easy removal of the flywheel.

The 10 x 40-inch crusher has a capacity of from 22 to 50 tons per hour, operating at 320 rpm; the recommended horsepower is 50; the weight is 14,500 pounds. The 10 x 28½-inch crusher has a capacity of 16 to 35 tons per hour, operating at 320 rpm; the recommended horsepower is 40; the weight is 11,000 pounds.

Fluted Steel Lighting Standards

Steel fluted street-lighting standards developed to meet the rigid specifications of safety engineers and the present economy programs of cities have been announced by the Philadelphia Electrical and Manufacturing Co., 1228-36 North 31st Street, Philadelphia, Pa. These Steelprest standards are manufactured from a heavy-gage open-hearth steel particularly suited for this purpose. The steel analysis, together with the cold working process by which the street-lighting standard is made, and the design combine to provide strength, elasticity and long life. The manufacturers



A PAIR OF PEMCO STANDARDS

claim a distinct advantage for these standards in the low initial and erecting cost, for the simplicity of erection and the lightness of the standard make for economy.

A heavy steel base plate for anchorage is an integral part of the standard. The ornamental cast iron base is designed to meet various requirements. Where preferred, the steel base of the standard can be made as an ornamental steel casting welded directly to the standard and so designed as to permit proper concealing of anchor bolts and nuts.

THE SPRACO MACHINE STENCILING LETTERS ON A ROAD, AND ALSO EQUIPPED FOR TRAFFIC LINE MARKING

Broad St., Durham, N. C.

Looking north from Main Street. This fine, hard-surface paving was laid with Trinidad Sheet Asphalt eighteen years ago. It is still good for many more years of service. There are more than a million and a quarter square yards of Native Lake Asphalt streets in Durham, N. C.

Long life and low maintenance cost

This is the record of Trinidad Lake Asphalt.

We have abundant proof in the service given by streets and roads laid or re-surfaced with Trinidad Lake Asphalt throughout the United States and in foreign countries.

If you are among those officials confronted with deteriorating streets and roads, yet with reduced appropriations to work with, consider the durability and economy of Trinidad Lake Asphalt.

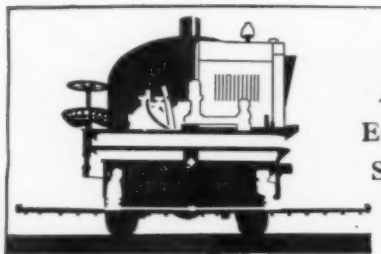
It may be used over foundations of old concrete, granite, brick, wood-block or macadam. You have a new road that will last for years—for the cost of an asphaltic top. And if repairs are ever needed they can be neatly made, and with maximum economy.

It will pay to investigate. Write for information regarding the outstanding record of Trinidad Lake Asphalt pavements.

THE BARBER ASPHALT COMPANY
Philadelphia

New York Chicago St. Louis

TRINIDAD
NATIVE LAKE
ASPHALT



Asphalt Distributors
Asphalt Kettles
Emulsion Sprayers
Surface Heaters
Tool Boxes
Oil Burners
Lead Furnaces

LITTLEFORD BROS.
500 EAST PEARL STREET
CINCINNATI, OHIO

Carey Elastite EXPANSION JOINT

makes *Good* Paving *Better*

The "sandwich" joint which protects concrete paving against expansion and contraction stresses. Proved by 20 years' use in highways and sidewalks in all parts of the world. Large stocks in principal cities insure immediate shipment. Write for catalog and 1932 prices.

THE PHILIP CAREY COMPANY
Department E-1 Lockland, Cincinnati, Ohio
Branches in Principal Cities

Portable Asphalt Maintenance Plants

A PORTABLE UNIT WITH A CAPACITY OF 400 YARDS PER DAY

ACCURATE CONTROL OF MATERIALS ASSURING ACCURATE MIXTURE TO COMPLY WITH ANY STANDARD SPECIFICATIONS

Send for Bulletin R-400

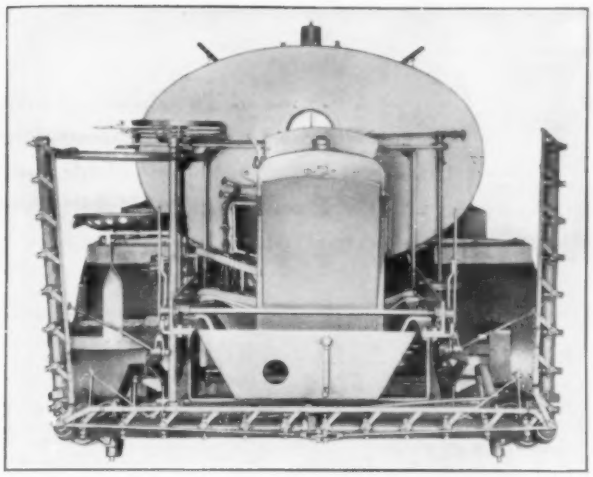
HETHERINGTON & BERNER INC.
INDIANAPOLIS, IND.

Stationary — Railway — Portable and Semi-Portable Plants

JOSLIN
Street Signs

10 POINTS of SUPERIORITY
1—Easily read
2—Weather proof
3—Unaffected by atmosphere
4—Do not chip, crack or break
5—Rigid construction and assembly
6—Du Pont Duco finish
7—Copper Bearing Galvanized Steel
8—Galvanized Steel Parts
9—99.4% pure aluminum
10—10-Year guarantee

For further information consult THE MUNICIPAL INDEX.
Send for literature and prices.
A. D. Joslin Mfg. Co., Merchandise Mart, Chicago, Ill.



REAR VIEW OF THE ETNYRE DISTRIBUTOR WITH THE SPRAY BARS IN THE RAISED POSITION

A Bituminous Distributor with a Circulating Spray Bar

A new feature of the bituminous distributor made by E. D. Etnyre & Co., Oregon, Ill., is the circulating spray bar, each nozzle of which is equipped with a valve to prevent drip after spraying. This spray bar is supported on universal brackets, and the pipe connections are made up with ball joints so that it can be raised, lowered and swung 9 inches to the right or left of the center. The spray bar is made up in sections, the center section being made of a 3-inch seamless steel tube welded at each end to one of the branches of a Y-shaped header. The end sections are made up in 2-, 4-, 6- and 8-foot lengths of 2¼-inch seamless steel tubing, and these end sections are connected to the header by the use of a hinged connection which turns on a tapered seat. The connections on the end section permit extending the bar to any desired length, although this is not necessary in order to spray a narrow strip, since any nozzle or group of nozzles can be thrown out of service by disengaging any lever or section of levers on the nozzle valves.

Although the spray bar is of the circulating type, it is not necessary to circulate the material through the bar during the process of heating, for it is connected at each end of the center section to a three-way valve on the primary circulating system. This primary system, which is completely enclosed in a metal housing, is used not only for circulating material to distribute the heat uniformly throughout the load and to provide agitation to prevent coking, but also for filling the tank. The only time the material is circulated through the spray bar is preparatory to spraying, and then only long enough to warm up the valves for easy operation.

The two three-way valves on the primary circulating system and the nozzle valves are linked together and are controlled by a single lever provided with a latch that engages either one or two other levers. There are but three operating positions of the levers. The raising, lowering and shifting operations, as well as the valves, are controlled by levers located convenient to the operator's seat, which is placed at the rear end on the left side of the frame in an elevated position where the operator is in a position to see the ends of the sprays.

With the Etnyre distributing system the pump acts as a meter and accurately measures the material delivered to the nozzles at all operating speeds, temperatures and pressures. A two-speed tachometer which is driven by a fifth wheel and which is used only when spraying has also been developed by this company. In the low range, the tachometer registers from 0 to 600, and in the high range from 600 to 1,200. A reading of 100 corresponds to a road speed of 1 mile per hour, 200 to 2 miles per hour, etc.

After the load is distributed the intake valve is turned to the filling position and the pump forces air through the spray bar, which carries the material in the bar back into the tank. The end sections are raised so that the material in the end sections flows down into the center section. In this way the entire bar is cleared with the exception of a pint or two, which may adhere to the walls of the bar.

This circulating spray bar is interchangeable with the regular spray bars on all Etnyre Model F and M distributors, made by E. D. Etnyre & Co. and any machine in the field can be equipped with this new spray bar at a small expense.

Changes in Meter Company Personnel

The Pittsburgh Equitable Meter Co., Pittsburgh, Pa., has announced the transfer of J. R. Howard from the Boston office, to the Philadelphia office of E. B. Wilson & Co., 1600 Arch Street, distributors for the Philadelphia District. Mr. Howard goes to Philadelphia with six years of experience in serving the requirements of the gas industry on Nordstrom valves in both the Chicago and the New England areas. He will handle the sales and service on such gas products as Emco meters, regulators and bell joint clamps and Nordstrom valves for E. B. Wilson & Co.

Best Becomes Associated with Morris Knowles, Inc.

F. P. Best, consulting engineer, Pittsburgh, Pa., has become associated with Morris Knowles, Inc., consulting engineers, Westinghouse Building, Pittsburgh, Pa., and 1 Wall Street, New York. Mr. Best and his associate, Wilfred Jupenlaz, will continue in independent practice with offices at 507 Westinghouse Building, but will be associated with Morris Knowles, Inc., in engagements of joint character and will specialize in planning, zoning, land subdivision, housing and municipal engineering, including investigations, reports, design and supervision.

New Features of Highway Guard-Rail

New features in the design of a highway guard-rail have recently been announced by the Tuthill Spring Co., 760 Polk Street, Chicago, Ill. The Tuthill guard-rail is built for ease in erection and to give maximum service with minimum maintenance cost. It consists of a 10- or 12-inch-wide steel rail, convexed, mounted on a flat leaf supporting spring which fastens to the base of the post. The rail sections are overlapped at the spring support and are slotted at one end, with round holes in the other end for ease in assembly and to permit expansion and contraction. The bolts which go through the rails fasten to the top of the spring. The spring support is of tempered spring steel of high tensile strength and the spring has slotted holes where it fastens to the base of the post, permitting variation in adjustment to keep a horizontal line at the top of the rail.

THE TUTHILL HIGHWAY GUARD PROTECTING TRAFFIC AT A BRIDGE APPROACH

Outdoor Lighting

A Section of *The American City*
Devoted to the Lighting of Streets, Highways, Bridges, Airports, Athletic Fields and Parks, and the Floodlighting of Public Buildings

Lighting for Heavy Traffic on Newark-Jersey City Viaduct

By J. L. BAUER
New Jersey State Highway Engineer

THE high-level steel viaduct* carrying the State Highway Route 25 connecting link from Jersey City through Kearny to Newark was opened to traffic on Thanksgiving Day, November 24, 1932. The viaduct extends for 3.74 miles, crossing the Hackensack and Passaic Rivers and the low, marshy land through which they flow. The roadway, which is from 100 to 140 feet above the ground surface, is 50 feet wide and has at each side a footwalk about 2 feet wide, the outer edges of which are protected by substantial steel railings.

As this highway will carry an exceptionally large volume of traffic, special study was made of the lighting facilities desired with the thought of providing adequate and uniform lighting of the roadway. The lighting arrangement adopted is as follows:

Light poles were set on the railings on each side of the roadway with a general spacing of 300 feet, and the location of the poles was staggered so that there is a light about every 150 feet along the roadway. The mounting height of the lights is 23 feet above the roadway and the lights are suspended from brackets, which are 8 feet long and extend about 6 feet beyond the curb lines. The lamp fixtures were made by General Electric Co. and utilized Holophane refractors, which prevent excessive loss of light outside the railing and make for uniform illumination of the roadway. The lamp size is 600 candlepower. The light posts are of simple design, intended to conform to the general design of the viaduct. They were fabricated of extra-heavy wrought iron pipe with fittings of steel castings. The light posts are fastened to the railing by means of heavy bolts.

The main conduits for the lighting system are made of Reading galvanized standard wrought iron pipe and are 2½ inches in diameter. They are located under the sidewalk and attached thereto by means of special hangers. At the base of each light post the conduits enter a manhole, from which connections are made to the light posts.

The primary cables are No. 8 solid A. W. G. single-conductor 7,500-volt American Steel & Wire Co. shielded rubber and braided cables and are arranged in four circuits, two of which originate at a Public Service Electric & Gas Co. pole in Newark, and the other two in Jersey City. The circuits are arranged in such a manner that should a failure of the cable occur in one circuit, the viaduct would still be lighted throughout its length but only every second light would be in service in the section where the failure had occurred.

The secondary cable from manhole to light fixture is No. 8 solid A. W. G. single-conductor 600-volt rubber and braided cable, connected in a manhole to a pole-base type IL transformer.

The lighting system is being operated on the regular street-lighting system of the Public Service Electric & Gas Co., which made the installation under contract with the State Highway Commission, with Colonel H. W. Hudson in charge of the work.

* An airplane view of this viaduct and its surroundings appeared on the front cover of THE AMERICAN CITY last month.

DAY AND NIGHT VIEWS, NEWARK-JERSEY CITY VIADUCT
These were taken in Kearny, N. J., looking toward Jersey City

"Economizing" on Street Lighting in the City of Detroit

By L. J. SCHRENK
General Superintendent,
Public Lighting Commission,
Detroit, Mich.

A Report to the Public Lighting Commission Which Shows Fatal Results of Reduced Illumination

THE necessity of every economy possible in all governmental functions on account of the present financial conditions brought about a general curtailment of street lighting in the city of Detroit.

Three years prior to January 1, 1931, a lighting program was in progress, to pratically double Detroit's street lighting. This program was brought to a complete standstill the latter part of 1930, thus giving Detroit its best street lighting in the year 1931.

The types of lamps in service in this city are the 4-ampere magnetite arc pendant lamps, 6.6-ampere magnetite arc upright fixtures and various sizes and types of incandescent lamps.

The total number of lamps in service was approximately 37,000; half of which are arc lamps and half incandescent. The incandescent lamps range in size from 4,000 lumens to 15,000 lumens, in the series type, and 500 watts to 2,000 watts in the multiple type.

Reduced Street Lighting

The reduction in street lighting started in the middle of December, 1931, and the greater part was in effect by January 1, 1932.

This reduction was carried out in several ways:

Approximately half of the incandescent lights in certain recent installations on main highways were taken out of service. These were the alternate lights on each side of the street, which have been operated normally from starting time until midnight. In the downtown section covered by white-way lighting this plan was later modified by taking out of service one of the fixtures on all the two-light standards, and resuming operation of all the remaining lights until midnight, after which time those on alternate standards were shut off.

The current value in all series incandescent and arc circuits was reduced from 5 to 9 per cent.

By July, 1932, a further curtailment was completed, by which several thousand lights between intersections were taken out of service. By this action, the number of lights in some residential sections, and on some semi-traffic streets, was reduced one-fourth to one-fifth.

How much the ability to see, on the part of pedestrians and auto drivers, was reduced is, of course, largely a matter of individual characteristics; however, the average illumination throughout the city was reduced approximately one-third.

Even after the program of increased street lighting had been under way for three years, only the downtown white-way lighting provided more illumination than necessary for actual traffic requirements.

The effect of lighting curtailment on traffic accidents was closely studied. The night fatalities increased to such an extent that by November 1, 1932, it was considered advisable to restore a major part of the curtailed service, even though the savings made during the first ten months of the year approximated $100,000.

Although there was a reduction of 10.2 per cent in the total number of fatals during the first ten months of 1932 over the corresponding period of 1931, the following tabulation of fatal accidents, separated in day and night fatals during the period of full street lighting of 1931 and the curtailed street lighting of 1932, shows some startling facts.

RECORD OF FATAL ACCIDENTS
FIRST TEN MONTHS OF 1931 AND 1932

	Full Street Lighting 1931		Curtailed Street Lighting 1932	
	Day Fatals	Night Fatals	Day Fatals	Night Fatals
January	13	30	5	39
February	4	14	9	23
March	6	13	6	8
April	11	10	5	16
May	17	8	13	6
June	23	11	9	9
July	26	6	8	8
August	11	10	12	9
September	7	12	12	10
October	10	13	7	17
	128	127	86	145
Total	255		231	
% of Total	50.3%	49.7%	37.2%	62.8%
% Reduction of total fatal accidents for 1932 over 1931				10.2%
% Reduction in day fatal accidents for 1932 over 1931				32.8%
% Increase in night fatal accidents for 1932 over 1931				14.2%

It is interesting to note that in 1931, with Detroit's best street lighting in service, the percentage of fatalities was approximately 50 per cent for both day and night. You will further note that in 1932 the daytime accidents were reduced from 128 in 1931 to 86 in 1932, or a reduction of 32.8 per cent. Assuming the same proportion to hold true both day and night in 1932 as in 1931, Detroit's night fatalities should have been approximately 86 instead of 145, an increase of 59 fatalities, or 68.6 per cent, which increase we believe is largely due to the street-lighting curtailment.

A further study was made on many of the main thoroughfares, where the greatest curtailment was made, separating the day and night fatal accidents during the same period of 1931 and 1932. The following tabulation shows the great value of street lighting:

	Full Street Lighting 1931		Curtailed Street Lighting 1932	
	Day	Night	Day	Night
Grand River	8	7	5	14
Grand Blvd	3	3	2	10
Warren Ave	3	3	3	9
Gratiot Ave	4	2	0	6
Harper Ave	4	5	0	4
Livernois Ave	3	2	1	6
E. Jefferson	4	5	4	7
Davison, W.	0	2	0	3
Dexter Blvd	0	1	0	2
6 Mile Road	2	1	1	5
McGraw	5	1	2	1
Mack Avenue	1	3	1	3
Vernor Highway	2	4	2	4
Woodward Ave.	4	8	2	2
Michigan Ave.	0	6	3	5
Fort St. West	4	6	2	2
W. Jefferson	1	2	1	1
Totals	48	61	29	84
% reduction in daytime fatal accidents				39.6%
% increase in night fatal accidents				37.7%

Assuming the reduction of 39.6 per cent in daytime fatals should have held true for night fatals, the reduction in night fatals would have been 39.6 per cent of 61, or 24, making a total of 37 fatals for 1932, or the difference between 61 and 24.

There were actually 84 fatal accidents instead of 37, an increase of 47 fatals or 127 per cent.

When the greatly reduced traffic at night is taken into consideration as compared to day traffic, the results of fatal traffic accidents in 1931 do not show any excessive street lighting.

The results of 1932, when the night fatals greatly increased, point out in no uncertain way that Detroit's main thoroughfares were never lighted excessively and that street lighting cannot be decreased without serious results.

The time from 5 to 8 p.m. is selected for further study because during this three-hour period the density of automobile traffic is greater than in any other equal period during the twenty-four hours. There are differences of weather and road conditions from one time of the year to another, but the most important difference, for present consideration, is in the fact that in the summer months the 5 to 8 p.m. period is practically all daylight, while in the winter months it is nearly all dusk or darkness.

The following tabulation shows that street lighting should not be reduced during this period:

FATAL ACCIDENTS BETWEEN 5 P. M. AND 8 P. M.

	1931		1932	
	Day	Night	Day	Night
January	2	13	1	14
February	.	4	2	7
March	2	3	..	3
April	2	2	2	5
May	13	..	6	..
June	5	..	5	..
July	8	..	4	..
August	1	2	1	.
September	1	2	4	2
October	2	8	1	5
	36	34	26	36

In accordance with the Detroit lighting schedule the hours of street lighting between 5 and 8 p.m. for the ten months period are 31 per cent of the total.

The above tabulation shows that approximately 49 per cent of the total fatals in this three-hour period occurred during the street-lighting hours, and in 1932 this increased to 58 per cent. Because of the above facts, it was the lighting from dusk to midnight, and particularly during this early evening period, which was restored November 1, 1932.

Although the above study deals in fatal accidents only, and no attempt has been made to evaluate them, it is sufficient to raise a serious doubt as to the economy of curtailing street lighting.

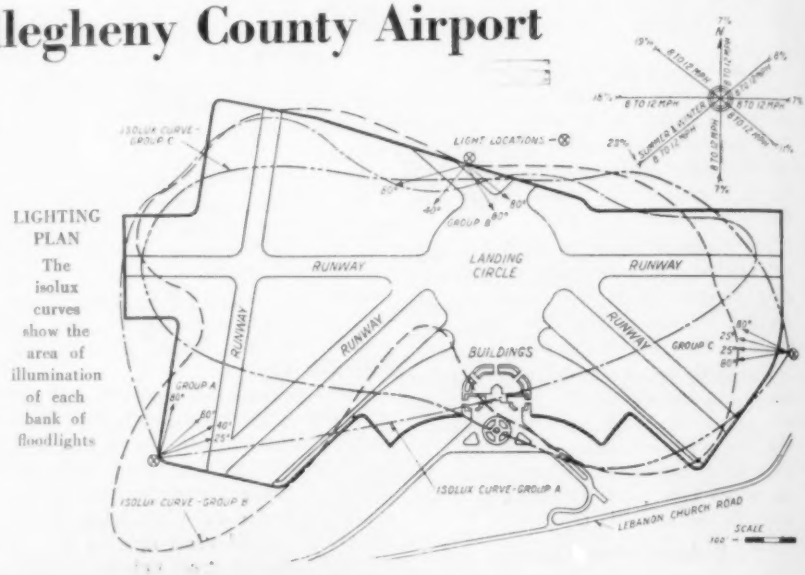
It is realized that there may be other factors which have had an influence upon the above results, but the records in Detroit parallel the changes in street lighting so closely that it is believed the savings in street-lighting costs resulting from decreased illumination are not justified.

Lighting the Allegheny County Airport

THE Allegheny County Airport, Pittsburgh, Pa., is 3,600 feet long and 1,800 feet wide, with the length lying east and west, and covers over 148 acres. Prevailing winds require the use of five runways with floodlighting banks placed to illuminate the entire field and yet not be blinding to a pilot on any of the five runways.

The lighting equipment was furnished by the Westinghouse Electric & Manufacturing Co., and includes the following:

1 24-inch rotating beacon, 1,000 watts
1 Flashing code beacon
12 3,000-watt airport landing-field floodlights
1 Direction-indicator wind tee
43 Cone-type boundary lights
21 Traffic-control lights
1 Ceiling projector
16 300-watt floodlight projectors
7 500-watt floodlight projectors
1 Control desk for manual control of all lights
1 Alidade



LIGHTING PLAN

The isolux curves show the area of illumination of each bank of floodlights

THE FLOODLIGHTED BUILDINGS

THE FLOODLIGHTED FIELD

The rotating beacon and the flashing code beacon are mounted on the Administration Building. The airport landing-field floodlights are mounted in three banks, and their locations are planned to facilitate night landing in any direction.

Three green and yellow traffic-control lights are placed at each end of each runway, and the circuits are so arranged that by the operation of a single switch on the control desk the green lights at either end and the yellow lights at the opposite end of any runway may be turned on, to indicate the proper landing direction on a given runway.

Control-desk specifications include:

On the center of the desk, to a suitable scale, will be placed a plan of the field, with all runways indicated. In the center of this plan, coinciding approximately with the position of the directional arrow on the field, will be placed a position indicator, with glass cover, giving a continuous indication of the wind direction, through operation by a transmitter motor attached to the wind tee.

At the end of each runway will be placed a single green and amber telephone type indicating lamp, corresponding to the traffic control lights on the field. These indicating lamps shall be controlled by toggle switches, which shall be provided for controlling the field lights, giving a true indication of the operation of the traffic-control lights on the field.

For the control of other circuits from this desk, "off" and "on" type toggle switches will be provided. Each switch shall be so marked as to indicate the circuit which it controls, and shall be provided with a red indicating lamp to show when the closing coil circuit of the contactor or switch which it controls, is energized.

The American City

MAR 13 1933

PERIODICAL ROOM
GENERAL LIBRARY
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Three Major Tasks for the New Administration:

(1) To overcome the absurd ideas that stopping public works is desirable public economy, and that tax reduction is more urgent than business expansion.

(2) To remove the "self-liquidating" requirements, high interest rates, and other handicaps which have restricted actual payments (up to February 15) to hardly more than one per cent of the $1,500,000,000 made available by Congress last July for loans by the Reconstruction Finance Corporation for public works and housing.

(3) To encourage states and municipalities to cooperate promptly and boldly in a nation-wide movement to lessen the need for charity, whenever it exists, by providing socially useful, self-respecting work for the involuntarily unemployed.

The Aerators and Control House of the Municipal Water Works of Selma, Ala.